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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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124TH ACNW MEETING

ADVISORY COMMITTEE ON NUCLEAR WASTE

(ACNW)

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WEDNESDAY

JANUARY 17, 2001

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ROCKVILLE, MARYLAND

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The Advisory Committee met at Conference Room 2B3, Two White Flint North, B. John Garrick, presiding.

COMMITTEE MEMBERS:

| | |
|-------------------|----------|
| JOHN GARRICK | Chairman |
| GEORGE HORNBERGER | Member |
| MILTON LEVENSON | Member |
| RAYMOND WYMER | Member |

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ACRS STAFF PRESENT:

John T. Larkins, Executive Director

Lynn G. Deering

Richard Major

Andrew Campbell

Robert Johnson, NRC

ALSO PRESENT:

Dr. Thomas Leschine

Larry Camper

John Ahearne

John Greeves

Paul Genoa, NEI

Bob Andrews

Bob Budnitz

Bob Bernero

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I-N-D-E-X

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P-R-O-C-E-E-D-I-N-G-S

(8:30 a.m.)

1
2
3 CHAIRMAN GARRICK: Good morning. The
4 meeting will now come to order. This is the second
5 day of the 124th Meeting of the Advisory Committee on
6 Nuclear Waste. My name is John Garrick, Chairman of
7 the ACNW.

8 Other members of the Committee include
9 George Hornberger, Milt Levenson and Ray Wymer. This
10 entire meeting will be open to the public. Today, the
11 Committee will hear a presentation by the NRC staff on
12 the Institutional Control Status, hear a presentation
13 on the principal findings in the National Research
14 Council Report, "Long-Term Institutional Management of
15 U.S. Department of Energy Legacy Waste Sites."

16 That presentation will be given by the
17 Chairman of the Committee, of that Committee, Tom
18 Leschine. We will meet with the Office of Nuclear
19 Materials Safety and Safeguards to discuss items of
20 mutual interest.

21 And finally, we're going to review the
22 ACNW 2000 Action Plan and discuss relevant changes for
23 our 2001 Action Plan. And in the course of this we
24 were going to be honored by having a discussion with
25 former NRC Chairman John Ahearne.

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1 Richard Major is the designated federal
2 official for the initial portion of today's meeting.
3 This meeting is being conducted in accordance with the
4 provisions of the Federal Advisory Committee Act.

5 We haven't received any statements from
6 members of the public regarding today's session. The
7 procedure is for anybody wishing to do so, to make
8 those wishes known to the Committee staff.

9 And as usual, it's requested that each
10 speaker be sure and use one of the microphones and
11 identify themselves and speak clearly. So with that
12 we're going to move directly to the Agenda.

13 The Committee member that has the lead on
14 institutional control matters is Ray Wymer, and I'll
15 turn the meeting over to Ray.

16 DR. WYMER: Thanks, John. This morning,
17 we're going to hear two presentations on the issue of
18 institutional control, which is a particularly thorny
19 issue in that it's open-ended. There is really no end
20 in time to institutional control.

21 It goes on as long as there is something
22 to be controlled, and in some cases that's a very long
23 time. We're going to hear first from the NRC staff.
24 Bob Johnson will talk about it, and then about the
25 NRC's approach and the handling of this issue up to

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1 this point and where they plan to go.

2 And then we'll hear from Tom Leschine,
3 who, as John said, chaired the Nuclear -- the National
4 Academy of Sciences Committee that wrote a report on
5 this about a year ago. So we'll start right off here
6 with Johnson and --

7 MR. CAMPER: Good morning, Mr. Chairman,
8 Committee. For those of you who don't know me, I know
9 the Committee does, I'm Larry Camper, the chief of the
10 Decommissioning Branch, and I wanted to make one or
11 two comments before Robert --

12 DR. WYMER: Okay. Fine. I'm sorry.

13 MR. CAMPER: -- gave you the briefing.
14 You know, in decommissioning we face a lot of
15 challenges. Decommissioning's highly visible. The
16 Commission has a great deal of interest in
17 decommissioning, and perhaps one of the most daunting
18 challenges that we face is with this question of
19 adequate institutional controls.

20 We have about 10 to 12 sites right now
21 that are opting to pursue the restricted release
22 scenario at this point in time. We've not had a site
23 go from A to Z yet. We've not put in place a
24 successful set of institutional controls.

25 So literally, we are talking with you in

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1 real time as we go through the implementation of the
2 license termination rule and the provision for
3 institutional controls set forth in sub-part (e) of
4 Part 20.

5 Robert is the project manager dealing with
6 the institutional controls issue. He's a member of
7 our Institutional Working Group and he has been the
8 lead on the staff as we work toward an arrangement,
9 hopefully, ultimately with the Department of Energy,
10 and he'll tell you more about that.

11 So I just wanted you to know from my
12 standpoint that we're putting a lot of management time
13 and energy into the institutional controls issue.
14 It's very challenging, in particular, finding a
15 responsible third party to step up to the plate and
16 assume the stewardship in perpetuity that's called for
17 in the Regulations.

18 So with that, I think I'll ask Robert to
19 step us through the briefing.

20 DR. JOHNSON: Thanks, Larry. Good
21 morning, and it's a pleasure to be with you today as
22 a speaker. I've in my past been your coordinator for
23 many years, so I trust that you'll be kind to me.

24 (Laughter)

25 DR. JOHNSON: But really, you now --

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1 DR. HORNBERGER: Fat chance.

2 CHAIRMAN GARRICK: We've finally got you
3 where we want you.

4 DR. LEVENSON: And some of us are new and
5 don't have to be kind to you.

6 (Laughter)

7 DR. JOHNSON: So we'll see how this goes,
8 but as Larry said, this is an emerging issue. It's a
9 new issue, not only that we're facing, but of course,
10 other federal agencies, Department of Energy and EPA,
11 are also wrestling with this issue, maybe on a
12 different scale, but it certainly -- our work on this
13 issue is very important.

14 And it's sort of right now, I kind of view
15 it as there's more questions about this issue than
16 there are answers. So I'll say I welcome your
17 questions. However, I may not have all the answers.

18 But it's good to kind of get those out and
19 understand, you know, what other people's views are,
20 what people think some of the key concerns are with
21 proceeding here. So today, in this talk I'll give
22 -- it's just to point -- kind of -- it's like a status
23 briefing.

24 In a sense, this is new and a starting for
25 us. We'd like to tell you where we are right at this

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1 point in time, and where we're headed. And then maybe
2 periodically, you know, as we go down this sort of
3 uncertain path, you know, we'll keep you informed you
4 and we'll brief you on the status of our progress.

5 But today, I thought it was useful to give
6 you some background, you know. What are just a
7 summary of the institutional requirement --
8 institutional control requirements of the license
9 termination rule, what we see the institutional
10 control issue to be, the NRC initiatives to seek
11 resolution, where we are right now with respect to
12 seeking that resolution, and then just mention, you
13 know, our involvement in keeping stakeholders
14 informed.

15 And of course, the ACNW is an important
16 stakeholder, too. I'd like to just go over some of
17 the requirements in the license termination rule. Of
18 course, as you're familiar, the license termination
19 rule allows for the option of restricted release,
20 assuming certain requirements are met.

21 And institutional control requirements are
22 one part of the set of requirements that would have to
23 ultimately be met for any site that is proposing for
24 a restricted release. And so today's talk is only
25 focusing on just those parts of the license

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1 termination rule.

2 First of all, with respect to dose
3 criteria, legally enforceable institutional controls
4 are required so that doses will not exceed 25 millirem
5 in the future. But the rule also included caps on
6 doses, assuming that institutional controls would
7 fail.

8 So in a way, I think the rule was
9 recognizing, you know, some of the issues that have
10 been brought up about it's not likely or it will be
11 very challenging for institutional controls to remain
12 effective over the time period, the long time period
13 that, you know, we're faced with.

14 And so as a result, caps were put into the
15 rule to minimize those consequences. Two caps,
16 possibilities are there that if controls fail that
17 doses would not exceed 100 millirem per year, or for
18 special cases they would not exceed 500 millirem per
19 year, and that's for special cases.

20 Now, let's look a little bit at the
21 special case for 500 millirem, because this is a
22 special case. It is a higher dose, of course; 100
23 millirem being public, you know, dose limit, the 500
24 exceeds that.

25 So the rule contemplated this would be

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1 very rare and certain very stringent criteria would be
2 needed if this were to be approved, and certain
3 conditions would have to be met if this were to be
4 approved.

5 First of all, it would only be, or this
6 particular case would only be acceptable if the
7 applicant could demonstrate that further reductions
8 down to the 100 millirem are either not technically
9 achievable, prohibitively expensive or would result in
10 net public or environmental harm.

11 So that's the first criterion that they
12 would have to meet. Secondly, they would -- the
13 applicant would have to put in durable institutional
14 controls. This might include things like redundant
15 controls, multiple; that is, multiple controls.

16 Should one fail, you know, others would be
17 available to act. This might include certain
18 engineering features that might be more durable. And
19 then lastly, government ownership was contemplated as
20 a possibility in the statement of considerations, and
21 possibly federal ownership and control.

22 Also, in the rule, five-year rechecks for
23 institutional controls were required so that doses
24 -- could be confirmed that doses would not exceed the
25 25 millirem. And this limits the time period.

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1 Should there be a failure, theoretically
2 anyhow, if you do have five-year rechecks then you
3 would only have a dose exceeding the 25 millirem limit
4 for a limited period of time, a five-year period of
5 time.

6 The rule also required that a government
7 entity or an independent third party be -- that
8 arrangements be made, you know, to either provide
9 oversight to make sure that the monitoring and
10 maintenance, you know, and the five-year rechecks were
11 being done or step in and provide for that themselves.

12 Finally, requirements for sufficient
13 financial assurance are put in place so that there is
14 funding available for rechecks and controls and
15 maintenance. So the net result for this special case,
16 500 millirem, if it's needed, you know, is that you
17 would be limiting it to five-year periods of time.

18 It would also be a flag that more durable
19 controls, whatever they can be proposed, you know,
20 would be needed. And so it's a way of saying, these
21 are the higher risk cases, and so more, much more
22 needs to be done, you know, to protect health and
23 safety over the long period of time for these
24 particular cases if they're to be approved.

25 The rule also has requirements to seek

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1 public involvement, in particular, that licensees are
2 to seek the advice of affected parties in the public
3 early in the planning process. And this is important
4 for two reasons in particular.

5 The local, state governments are often the
6 ones that understand the controls that are appropriate
7 for this particular area the best. Which ones, you
8 know, are going to be most effective, most
9 enforceable?

10 So it's important to get their advice
11 early on in the planning stage. Secondly, seeking
12 advice from the public is important because they're
13 the people that are going to be affected. They're the
14 people that will be living with the facility, you
15 know, for a long period of time.

16 And so their views on impacts to them and
17 their community are important to consider. It's
18 important also to say that the decommissioning plan
19 that is required before any remediation begins is to
20 contain the plan that the licensee has for
21 institutional control.

22 And it's to contain a number of the things
23 listed here. It's a report on how they sought the
24 advice of stakeholders, what things were recommended
25 by the stakeholders and how they considered the

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1 stakeholders' input in coming up with their
2 institutional control plans in the decommissioning
3 plan.

4 So this is all done up front before any
5 work is started. It's also done up front when the
6 planning for remediation is going on, so that you have
7 this sort of integration of how you're planning for
8 the long-term institutional controls, and maybe how
9 that fits into the actual clean-up of a site.

10 All that is done up front in the
11 decommissioning plan before any work begins. All that
12 is done, the input from the parties is done up front.
13 The rule asks that advice be sought from the public on
14 whether or not they feel doses, you know, will exceed
15 25 millirem; sufficiency of financial assurance.

16 Will the controls proposed by the licensee
17 be enforceable? And then making sure that the plans
18 proposed will not impose undue burdens on the local
19 community or the affected parties.

20 The NRC, of course, will review what the
21 licensee has done and how they've considered the
22 public input as the staff, you know, reviews and
23 approves the plan.

24 The rule also has requirements for
25 sufficient financial assurance to allow a third party,

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1 including a government custodian, to assure and carry
2 out the five-year rechecks in the control and
3 maintenance.

4 In the event that, you know, the
5 arrangements that the licensee has made, you know,
6 fail financially, there will be a fund, you know, set
7 up that would provide funding for this over the time
8 period needed.

9 Now, what is the issue? I've just sort of
10 summarized, glossed over the requirements in the rule,
11 but what is the issue? And of course, I think it
12 first focuses on durability. We certainly have
13 mentioned that the institutional controls require a
14 long time period.

15 And when you look at the 10 or 12 sites
16 that currently we're thinking are either planning or
17 considering restrictive release, for the most part
18 they're uranium/thorium sites, long-lived radio
19 nuclides that will require up to a 1,000-year time
20 period for controls.

21 And so this long time period is one of the
22 challenges. And you know, there are many factors that
23 could contribute to durability, you know, that you
24 might hope would help deal with this challenge like
25 redundancy or layering of controls that might be

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1 proposed, like I said, the five-year rechecks, and
2 having funds available.

3 These all contribute, you know, to
4 achieving, you know, the duration or making sure that
5 the controls remain effective over the time period.
6 But the time period is still unprecedented. It is
7 kind of the crux of the problem.

8 And I think, of course, as we'll hear in
9 the talk after myself from Dr. Leschine, the National
10 Academy Report identified a number of limitations on
11 institutional controls. I'll just mention a few, but
12 of course, he'll be giving you the summary.

13 But some of their conclusions were that
14 there's a limited likelihood that controls will remain
15 in effect over this time period. Some oversight
16 enforcement in enforcement of these controls is
17 needed, but there's going to be a lot of difficulty in
18 enforcement and in providing sustained oversight.

19 What we need, they concluded, was some way
20 of detecting failures that might occur, and then the
21 ability to correct over that long time period. So in
22 a way, I might say that some of the requirements in
23 our license termination rule addressed some of the
24 National Academy recommendations, like our legally
25 enforceable controls, five-year rechecks, independent

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1 oversight, financial assurance.

2 You know, these are all good things in the
3 rule, you know, that at least and of course, some of
4 these issues in the National Academy Report are not
5 new. They've been around, and so our rule
6 incorporated a lot of thoughts on what might make
7 these effective.

8 However, that's sort of the good news
9 part. The rule has some good things in it, you know,
10 but we're now finding difficulties with implementing
11 those requirements.

12 We're finding difficulties in identifying
13 willing and acceptable governments or independent
14 third parties, you know, to provide the continuity,
15 the sustainability, the oversight, the enforceability.

16 There's a potential and in some cases a
17 real unwillingness of local and state government to
18 accept this long-term responsibility. Secondly, there
19 are a lot of concerns raised, also in the National
20 Academy Report, with the long-term effectiveness of
21 private arrangements, ownership, passage of ownership,
22 you know.

23 How do you maintain or transition from one
24 owner to the next, you know? How do you assure that?
25 And then lastly right now, at this point in time

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1 there's uncertainty regarding DOE's agreement to
2 assume authority provided by the Nuclear Waste Policy
3 Act, for them to provide long-term institutional
4 controls for sites like ours.

5 I'll talk a little bit more about this in
6 a minute, about this provision in the Nuclear Waste
7 Policy Act. But the way the law is written, it's
8 discretionary rather than mandatory that DOE assume
9 this authority.

10 So where do we go from here? We have an
11 initiative underway or just beginning to resolve this
12 -- hopefully resolve this institutional control issue.
13 We have begun discussions with DOE regarding the
14 feasibility of DOE providing long-term institutional
15 control under the Nuclear Waste Policy Act, what we
16 call 151(b).

17 That's the shortcut, you know, 151(b). We
18 met in December, first with DOE most recently, and
19 we're meeting again this week. We've provided them
20 background information about our rule requirements,
21 about the sites that we envision are possibilities in
22 going this route, and we proposed some plans for
23 proceeding, you know, for their consideration.

24 Again, we emphasize the point that we're
25 really only looking at maybe 10 or 12 sites that are

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1 currently considering restrictive release. The actual
2 number of sites that might be candidates for transfer
3 to DOE might be far fewer.

4 And that has to be worked out, you know,
5 as licensees firm up their plans, as the staff, you
6 know, reviews their applications. But in any event,
7 it's important to understand, you know, for DOE to
8 understand, for others to understand how many sites
9 we're thinking of and the nature of our sites compared
10 to sites that DOE may be used to, more used to in
11 facing every day within their complex.

12 Those are far smaller, far simpler
13 relatively speaking. So that's important for all of
14 us to keep in mind. Like to point out that in
15 December the Commission did approve the staff's
16 initiative to seek an MOU with DOE regarding 151(b).

17 And very importantly, the Commission wants
18 to be kept informed about our progress, and we're to
19 immediately inform them if we're not successful in
20 gaining DOE's agreement, you know, for possible
21 transfer of these sites.

22 Now, let's just summarize a little bit of
23 what the Nuclear Waste Policy Act, 151(b) provisions
24 include. As I said before, DOE is authorized to
25 assume title and custody of the low-level waste and

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1 the lands following license termination by NRC.

2 And then they would be the owner and they
3 would provide protection over the long-term, but
4 that's discretionary and DOE has to agree to accept
5 that authority. There are conditions specified in the
6 Nuclear Waste Policy Act for Commission
7 determinations.

8 One is that, of course, our license is
9 terminated. Two is that NRC requirements, including
10 financial assurance, have been met, that there would
11 be a no-cost transfer to the federal government.

12 And then the Commission would have to
13 determine and make a finding that federal ownership is
14 either necessary or desirable for protection of the
15 public health and safety over the time period.

16 Now, I'd like to just sort of mention a
17 few of the benefits that might be gained by proceeding
18 with this approach to resolution. We feel that the
19 federal government may be in the best position to
20 provide sustainable controls over the long-term.

21 Of course, I don't think that you can
22 really guarantee something for the time period we're
23 looking at, but you can do the best you can, and
24 federal control may be the best way for achieving
25 sustainable controls.

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1 But federal control may be the only option
2 that we have if local and state governments are
3 unwilling to accept this responsibility. Our rule did
4 say local, state or federal governments might be
5 preferable, you know, for providing this type of
6 oversight long-term control.

7 Federal control may be the most convincing
8 way to assure the affected parties that the controls
9 will be sustainable. But of course, I'm sure there'll
10 be many concerns about, you know, showing that or
11 demonstrating that.

12 The statement of considerations in the
13 license termination rule notes that federal control is
14 acceptable. So the Commission previously, or when the
15 rule was promulgated, you know, did consider that
16 particularly for sites with the uranium/thorium long-
17 lived radio nuclides that federal control is
18 acceptable.

19 The statement of considerations in the
20 license termination rule also recognized that DOE is
21 an option under the Nuclear Waste Policy Act 151(b).
22 So they at that time recognized that this particular
23 part of the law was applicable to these kinds of
24 sites.

25 We feel that resolving the institutional

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1 control issue is very necessary for the acceptability
2 of the restrictive release option. If this issue
3 can't be resolved then that option is going to be very
4 difficult, if not impossible, to implement.

5 Lastly, DOE has valuable experience and
6 expertise in long-term stewardship. You're probably
7 aware that, I think it's over the last 11 years
8 they've been working with us under UMTRFCA, and for
9 the Title I sites, about 20 sites have been -- or
10 long-term stewardship arrangements have been set up
11 and DOE is providing long-term stewardship for those
12 sites.

13 And I believe two Title II sites have been
14 transferred to DOE and long-term stewardship. So
15 under -- we have worked together with them under this
16 program for very similar sites. Although they may be
17 larger sites, they're very similar, and we've had a
18 very positive experience working that.

19 It's been successful. Of course, DOE will
20 also have the responsibility for long-term stewardship
21 of their sites, over 100 sites. And they're in
22 transition, as you know, some of you know very well,
23 and their responsibilities for long-term stewardship
24 for these more complex sites, you know, will be
25 growing in the future.

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1 So they're experience and their expertise,
2 you know, there's a fair amount right now, but a lot
3 more will be growing in the future. So this is a
4 benefit to our few sites kind of going in with that
5 pool, we feel.

6 I'd like to mention that we're just
7 beginning our talks with DOE, as I mentioned. Of
8 course, in the transition with the administration and
9 some of their people that have been in leadership
10 positions, there'll be a changeover.

11 And so more background and negotiations,
12 you know, are planned, you know, over the next few
13 weeks and we'll probably have a better idea of where
14 we're headed in the next few weeks.

15 But the Commission has asked us to give a
16 status report next October, you know, of our -- of how
17 we've progressed, unless, you know, there's something
18 to report on sooner than that.

19 So today is more of letting you know that
20 we're starting this effort, and where we're headed in
21 general, and we'll keep you informed of the status
22 along the way. What I also wanted to mention is that
23 we're keeping our stakeholders and licensees informed,
24 also.

25 In the November workshop on

1 decommissioning with industry and other stakeholders
2 I gave about the same talk to them, letting them know
3 of the issue and how we're proceeding, and invited any
4 feedback from them at that time.

5 And we plan on keeping them informed, as
6 there are important -- as important progress comes up.
7 If we have an agreement in principle or if we have a
8 draft MOU, we'll be involving those stakeholders
9 appropriately. So that's an important part of our
10 step.

11 So in conclusion, this is an important
12 issue for us. We wanted to keep you informed about
13 starting work in this area. And while it's very
14 important for us and we've made that case to you I
15 think this morning, you now, we welcome your feedback,
16 but it really depends on how much, you know, you want
17 to be involved with this issue.

18 But at least I think we should keep you
19 informed because it is important to the success of the
20 whole part of the Decommissioning Program, that is,
21 the part that relates to potential restricted release
22 sites. Any questions?

23 DR. WYMER: Thank you very much. I had a
24 couple of comments and then a question. One is, this
25 problem divides itself pretty cleanly into two parts.

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1 There's the institutional controls part, which is sort
2 of the legalistic part, the who owns it and who's
3 responsible for it and financial assurance.

4 And then there's the other part, which is
5 the technical part, which how in the world do you keep
6 this stuff where you want it, which is really the
7 issue that relates to health and safety. How do you
8 keep the material from getting out and affecting
9 people?

10 On the technical side -- the first side is
11 much more difficult, the financial assurance side and
12 the guarantees and that sort of thing. That's a
13 thorny issue.

14 The technical side, just to throw out some
15 thoughts with respect to what might be required on the
16 part of NRC on a development or research program, the
17 areas that emerge pretty cleanly are hydrology and
18 early nuclide transport.

19 There needs to be a lot understood about
20 what the water does and what the radio isotopes do
21 when they move. There's some work going on in the
22 research program on the retention of radio nuclides.

23 And then a second R&D point is monitoring.
24 You mentioned monitoring and that's extremely
25 important, and it's particularly difficult because it

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1 has to be done over such a long period of time.

2 So the instrumentation has to be durable,
3 has to be maintained. So there's a major monitoring
4 activity, which is a technical problem. And a third
5 area is the one of engineered barriers where if you
6 want to gain assurance that you're going to -- or
7 reasonable assurance that you're going to keep the
8 material contained, then you probably, often you will
9 not be able to rely on just what is naturally in the
10 environment, what the setting is, the natural setting
11 is.

12 And there have to be some sort of
13 engineered barriers like chemically reactive screens
14 that are put into the ground, absorbents of various
15 kinds, or other kinds of materials that can sequester
16 these materials.

17 One of DOE's favored approaches, as I
18 mentioned to you before the meeting is a pump and
19 treat approach, which is not a long-term answer. You
20 can't keep pumps running very well for hundreds of
21 years, and you can't keep treatment plants running for
22 hundreds of years reliably without a lot more
23 assurance than it's likely that will be available.

24 So the third point is engineered barriers
25 from the technological point of view. That's my

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1 speech. Now, I had a question. You talk about
2 uranium and thorium sites, but it seems to me that,
3 you know, you got 104 reactors sitting out there, some
4 of which will have probably institutional controls
5 over those sites.

6 So I don't think that this business of
7 going to green field, while it's a goal of all the
8 utilities, they'd love to all go to green field,
9 that's their stated goal, it may well not be possible
10 in all cases to get to green field, and there'll be
11 restricted release sites.

12 I wondered why those weren't mentioned in
13 what you were talking about.

14 DR. JOHNSON: I'll attempt to answer part
15 of the question, but maybe some of the other staff
16 might support me. As currently, as I've been told,
17 reactor sites right now aren't proposing restricted
18 release, although --

19 DR. WYMER: I know they're not proposing
20 it.

21 DR. JOHNSON: -- they're certainly -- I
22 mean, we're saying this certainly could be an issue in
23 the future, and I don't know if Larry or others might
24 want to further elaborate on that. But that certainly
25 is a possibility in the future.

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1 MR. GREEVES: It's not a plan.

2 DR. JOHNSON: It's not a --

3 MR. GREEVES: The reactors are all telling
4 us that, you know, they're going to clean up to our
5 criteria. John Greeves, for the record.

6 And Larry, just jump in here, but --

7 MR. CAMPER: Yes. No, I would -- John,
8 simply I would only add to that. I mean, we have no
9 indications at this point that any of the reactor
10 facilities would be pursuing a restricted release
11 scenario.

12 In fact, what we're finding is for reactor
13 sites, as compared to some of the processing sites
14 like Robert's referring to, I mean, the reactor sites
15 are pristine by comparison.

16 I mean, they're able in their unrestricted
17 release scenario, in fact, to demonstrate DCGLs and
18 clean-up methodologies that can come down to a few
19 millirem, I mean, a few millirem.

20 So probably, the most complicated thing
21 that I might foresee in some reactor sites would be
22 the potential for groundwater problems. You know, the
23 reactors have a rent program which is designed to
24 monitor off-site biota and water and what have you,
25 but we're finding that there's more of a need for on-

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1 site groundwater monitoring.

2 And there might be a few sites where
3 there's a groundwater issue, but by and large, at
4 least at this stage of the game, there's not an
5 indication that the reactor sites are going to need to
6 or want to pursue a restricted release scenario.

7 DR. WYMER: This sort of goes back to one
8 of the presentations we had yesterday on entombment.
9 And there were some indications that there might be
10 some possibility for restricted release -- during that
11 discussion -- at reactor sites.

12 So I certainly agree it would be highly
13 desirable to go to unrestricted release, green field,
14 for the reactor sites, but I don't know.

15 MR. CAMPER: Well, of course, the
16 fundamental difference there in the entombment
17 approach is the degree of clean-up that takes place as
18 compared to pursuing an unrestricted release. You
19 know, under entombment, of course, the idea is to do
20 some clean-up and ultimately come down to the question
21 of what to do about greater than Class C waste under
22 entombment --

23 DR. WYMER: Yes, that's right.

24 MR. CAMPER: -- is it in or is it out.
25 That's a big deal.

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1 DR. WYMER: It is a big deal.

2 MR. CAMPER: So the question is, you're
3 letting this scenario -- you're entombing it. You're
4 letting it cool off as a mechanism of decommissioning,
5 as opposed to --

6 DR. WYMER: Yes.

7 MR. CAMPER: -- pursuing a rather
8 extensive clean-up.

9 DR. WYMER: Yes.

10 MR. CAMPER: And of course, unrestricted
11 release. So fundamental difference there, as you
12 appreciate, I'm sure. But again, the problem that we
13 see for the restricted release scenario and the sites
14 that are, you know, unrestricted release, or the
15 complicated materials --

16 DR. WYMER: Yes.

17 MR. CAMPER: -- and their processing
18 sites, and there's extensive contamination in many
19 cases. That's not the case for the reactor sites.

20 DR. WYMER: No. No, I --

21 MR. CAMPER: Which of course, is a good
22 thing.

23 DR. WYMER: Yes. Okay. Well, I just
24 wondered why it wasn't even mentioned that it was --

25 MR. CAMPER: Yes, right. It was a good

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1 question.

2 MR. GREEVES: Let me just add, if I could,
3 we're prepared to deal with both, and you got a
4 briefing, apparently, yesterday on entombment.

5 DR. WYMER: Yes, we did.

6 MR. GREEVES: So that would be the vehicle
7 that we could use, per chance, somebody in future
8 years came forward with that approach. The industry's
9 interested enough to have asked us to look seriously
10 into the entombment topic, but that would be subject
11 to -- you know -- advance notice of rule-making, and
12 I'm sure we'll get plenty of comments on it.

13 So I think that's something we'll be back
14 talking to you about and you'll get a lot of
15 visibility of.

16 DR. WYMER: Well, it was just -- of
17 course, it's certainly an observation about the
18 reactors. I understood that the plan was in fact to
19 go to green field.

20 MR. GREEVES: NEI's in the audience if you
21 want to hear from them. That's up to you.

22 DR. WYMER: Well, if you've got a few
23 comments, Paul, you might want to kick them in.

24 MR. GENOA: Yes. Thank you. Good
25 morning. Paul Genoa, with NEI. And in fact, your

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1 point is well-taken. We have every belief that
2 virtually all the operating reactor sites in the early
3 decommissioning sites can be released under the
4 current unrestricted release scenario.

5 But we are looking to the future and the
6 future is not, you know, completely certain. Low-
7 level waste disposal has been unavailable to certain
8 generators in the past, and we view in the future it's
9 possible again.

10 We would ask that the entombment option be
11 explored so that we know that there is a safe way to
12 decommission a power reactor, even in the absence of
13 available low-level waste disposal. So we're looking
14 at it from a contingency point of view.

15 DR. WYMER: Oh.

16 MR. GENOA: And we certainly believe in a
17 performance-based rule, if that's possible. The only
18 thing I would add is there are situations. I mean, we
19 do have the -- you know -- the failed TMI facility.

20 It's possible that that might be a
21 restricted release, entombed facility at some point.
22 It may make more sense to deal with it in place, in
23 situ, as you pointed out yesterday, as opposed to
24 moving it somewhere else.

25 That's just an example. It has not been

1 proposed by the company, but I use it for illustrative
2 purposes.

3 DR. WYMER: Right.

4 CHAIRMAN GARRICK: While you're here I
5 wanted to ask, many of the sites, the reactor sites
6 have on site low-level waste burial facilities.

7 MR. GENOA: A few have had very low
8 licensed material at very low concentrations disposed
9 of on site. That's true.

10 CHAIRMAN GARRICK: Yes. Is it your
11 expectation that those would -- those sites would be
12 removed or --

13 MR. GENOA: Not necessarily. The criteria
14 that's been used under the 2002 and the old 20.302,
15 alternate disposal requests, were always in the range
16 of a few millirem.

17 DR. WYMER: A few millirem.

18 MR. GENOA: That I know of. And of
19 course, the requirements are that we go back and
20 reevaluate those at license termination, and that the
21 dose components of any of those on site disposals must
22 be factored into the equation of the residual activity
23 and the dose consequences to the public.

24 So those would be considered under license
25 termination. And our view is that all that I know of

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1 would, either unremediated or remediated, meet the
2 unrestricted release criteria.

3 CHAIRMAN GARRICK: There is a couple of
4 cases of tritium contamination as -- would you say the
5 same applies there?

6 MR. GENOA: I don't --

7 CHAIRMAN GARRICK: We mentioned TMI. We
8 know that there's some tritium contamination.

9 MR. GENOA: Yes. That facility I think is
10 on a more complicated site and is not characteristic
11 of the other sites. I'm not aware of any of the other
12 sites that have groundwater contamination exceeding
13 drinking water standards. And you know, I'm not sure.

14 CHAIRMAN GARRICK: Okay.

15 DR. WYMER: Thank you, Paul. It's always
16 good to have the industry perspective. With respect
17 to trying to guess what's going to happen in the
18 future, Nils Bohrs, quoted a note, said: "Predictions
19 that are very uncertain, especially about the future."

20 (Laughter)

21 MR. GENOA: I find that to be the case.

22 DR. WYMER: Are there anymore questions of
23 Paul?

24 DR. LEVENSON: I have I guess two
25 comments. One, I'm sort of intrigued by your position

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1 that states are unwilling to accept responsibility and
2 authority.

3 In the part of the world where I spend a
4 few days a month that I'm not concerned with ACNW I've
5 been involved with a fair number of things at the
6 state, county, city and all the way down to local
7 school boards where the federal government has
8 mandated unfunded responsibilities and liabilities.

9 And this seems to be a unique position of
10 the federal government, that they don't have the
11 ability to mandate that. I wish that could be
12 extended to other parts of the government. It really
13 is -- you really are taking a unique consideration.

14 (Laughter)

15 The other comment I want to make is
16 somewhat in the same line as Ray's about the business
17 of, we need to know more about retention and
18 hydrology, because if we accept what we know now in
19 the current modeling there would not be a single ore
20 body anybody -- anywhere in the world that our current
21 assumptions about how rapidly things move through
22 nature clearly is not sustained by what happens in the
23 real world.

24 So it's kind of a plea to direct our
25 research and our thinking that we can -- in the near

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1 term we can make overestimates of things and then say,
2 well, we'll do this.

3 For the very long term where we're not
4 going to be doing things, it's very important that was
5 have a more basic understanding of what is real, not
6 what is computed.

7 DR. WYMER: All right. George? John?

8 CHAIRMAN GARRICK: I wanted to pick up on
9 this option in the rule of the -- what I'll call the
10 walk away option with a 100 MR and the 500 MR caps.
11 What other provisions are there, other than dose, for
12 removing institutional controls?

13 DR. JOHNSON: For removing institutional
14 controls?

15 CHAIRMAN GARRICK: Well, the one option is
16 -- the conditions under which you can essentially walk
17 away from the site.

18 DR. JOHNSON: If I understand your
19 question, I think the license would be terminated.

20 CHAIRMAN GARRICK: Yes.

21 DR. JOHNSON: If you have one of those --
22 well, either you demonstrate 20 -- you don't exceed 25
23 millirem.

24 CHAIRMAN GARRICK: Right.

25 DR. JOHNSON: And assuming institutional

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1 controls fail, you either are not exceeding 100 or not
2 exceeding 500 --

3 CHAIRMAN GARRICK: So the failure of the
4 institutional controls is not the same as eliminating
5 the institutional controls.

6 DR. JOHNSON: No. It's a calculation
7 again, you know, of what if, you know, we know they're
8 fragile. We know they may not last. So calculate
9 what the dose would be, assuming they fail.

10 And then that's intended to limit the
11 consequence, should they fail, to either the public
12 dose on that or in very special cases, the 500
13 millirem. And I listed all those requirements, you
14 know.

15 It's a stringent set of requirements that
16 would have to be met, you know, if you had a situation
17 under the 500 millirem cap situation.

18 CHAIRMAN GARRICK: You talked a little bit
19 about experience and the DOE has already had quite a
20 bit of experience in institutional control. Also,
21 hasn't EPA had a considerable amount of experience
22 with institutional control of nonradioactive sites,
23 but with hazardous sites?

24 DR. JOHNSON: Exactly.

25 CHAIRMAN GARRICK: And has that had any

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1 bearing on any of your approaches?

2 DR. JOHNSON: I think it's -- like I said,
3 this is early in our getting involved, but you know,
4 recently I attended a conference and EPA gave a
5 presentation of where they are.

6 And they summarized, saying they have over
7 600 sites that are currently in the five-year recheck
8 or their institutional control time phase, and around
9 3,000 separate institutional controls at those 600
10 some sites.

11 So yes, they do have a lot of experience.
12 You know, we haven't yet kind of aggressively looked
13 at what things might pertain to our particular sites.
14 However, some of our staff, you know, have been
15 involved with, you know, looking at their guidance and
16 looking at, you know, their past experience, and this
17 may be useful.

18 CHAIRMAN GARRICK: Yes. This sounds like
19 a classical case for risk harmonization as far as an
20 opportunity for it. Are there any genuine gestures,
21 given that we're now looking at institutional controls
22 for nuclear sites for looking at the more broader
23 issue of consistent regulation of hazardous sites in
24 general?

25 Are there some over-arching requirements

1 that are evolving?

2 DR. JOHNSON: I guess I can say I'm only
3 aware of the one study that recently was done by an S-
4 Core (phonetic) subcommittee to compare --

5 CHAIRMAN GARRICK: Yes.

6 DR. JOHNSON: -- the requirements and
7 guidance among DOE, NRC and EPA, and I think that was
8 recently published. John, do you have any --

9 MR. GREEVES: Yes. John Greeves again.
10 We're at what I would describe the front end of this
11 process in terms of our regulation, but there are a
12 number of paradigms out there in terms of
13 institutional control.

14 You're going to hear from Dr. Leschine
15 shortly, and I'm sure he looked into some of these.
16 But there are the CERCLA approach. That's under a
17 piece of -- it's a different piece of legislation, and
18 I think we do need to go to school as to what has EPA
19 done with those 600 sites.

20 But it's a different paradigm. They don't
21 require, to my knowledge, federal or state control.
22 They do require the five-year rechecks. And you know,
23 600 cases, that's a lot of experience.

24 So I think, Larry, that's something we
25 really should go to school on. We've worked with EPA.

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1 They're part of the Interagency Steering Committee on
2 Radiation Standards. What we have done is looked at
3 the various regulations that are on the book, and
4 evaluate how institutional controls is effected for
5 each of those.

6 And we've gone to international meetings
7 and made those presentations, mostly comparing what
8 the differences are. It is very hard to harmonize
9 between legislation. You have one set of legislation
10 that controls the CERCLA sites.

11 Another paradigm is the DOE paradigm.
12 They're automatically responsible for their sites.
13 They provide institutional control for those "100
14 sites" that are out there.

15 A third paradigm is Part 40, our
16 regulation which is really a commercial site that by
17 legislation turns over to the Department of Energy at
18 a certain point in time. So that's a third paradigm.

19 The fourth paradigm is the one we're
20 dealing with, which is a commercial site that is not
21 required for the Department of Energy to pick it up.
22 It is discretionary.

23 So this is kind of a web that I expect
24 we're going to be talking to you about for the next
25 year or two, and sorting out over time. We need to do

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1 more homework on what EPA is doing, because they may
2 have some techniques that would be quite valuable to
3 us. So Larry, you want to add?

4 MR. CAMPER: Yes, let me add to that. I
5 mean, I think you did a great job of framing the
6 paradigms, the possibilities. I mean, where we are as
7 a staff right now is we have the license termination
8 rule which went into effect in the '96-97 time frame.

9 Arguably, the institutional control
10 scenario called for in the LTR is a stringent
11 standard. It really -- it requires very precise
12 things in terms of durable institutional controls,
13 financial shorts and what have you.

14 We know that we have this population of 10
15 or 12 sites that appear to be headed that way. So
16 we're trying to make sure that the institutional
17 control as envisioned in that regulation can in fact
18 be carried out.

19 What we're finding out is that it's
20 problematic. We're finding, for example, in one case
21 a state -- I won't name the state; it's not important
22 -- but a state that has some of these sites made it
23 very clear there's simply no way they were going to
24 step up and become this third party.

25 Too much -- too many unanswered questions.

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1 The standards may change. The role of government may
2 change. Politics is a factor. Why do I want to
3 assume responsibility for this site as a state that I
4 don't have right now.

5 We don't mandate under our approach that
6 they would do that. That is unusual, you're right, in
7 some cases. We are finding -- we had one entity that
8 came in and proposed a private enterprise scenario.

9 They have subsequently withdrawn that.
10 They're not going to pursue restricted release after
11 all. They're going to go with unrestricted release,
12 take everything off site. The problem with the
13 business approach was you start to worry about
14 continuity and stability of a business arrangement for
15 1,000 years.

16 It raises a litany of questions that have
17 to be answered. So it was going to be problematic.
18 It was going to pose a lot of questions. I don't know
19 if in the final analysis it would have been sustained
20 or not. I doubt it, but it's possible.

21 So we look at this and we say, okay, we
22 have this criteria now. What is the most viable
23 entity that -- whose paradigm is closest to ours that
24 has the experience and infrastructure for managing
25 these sites in perpetuity, if it comes to that, vested

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1 upon that entity?

2 We also recognize and we've had some early
3 discussions amongst ourselves that as we go down the
4 road, let's say, for example, if we're not successful
5 in working out an arrangement for an MOU with the
6 Department of Energy, then we're going to really have
7 to stop and come back and say, okay.

8 Now, what have -- what is our experience
9 to date on this institutional control scenario called
10 for in our regulations? The DOE's scenario didn't
11 work out. What do we do now? What do we do now?

12 And one of the things we have in fact
13 talked about, as John alluded to, is what other
14 paradigms are out there? How do they work? Might it
15 necessitate going back to the Commission and saying,
16 we have this approach in our regulations.

17 We now have some experience, some three,
18 four, five years of experience. We have found the
19 following. We believe we now need to do x or y. It
20 could come to that and your point is along those
21 lines.

22 CHAIRMAN GARRICK: Yes. Yes. Well,
23 there's always the question of, if we're being
24 motivated here to protect the health and safety of the
25 public, what contribution to the health and safety of

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1 the public are we making by focusing on the nuclear
2 sites and somewhat isolating them in terms of how we
3 perform things like institutional control?

4 And you can't help but wonder if this
5 isn't one-tenth of one fraction percent of the real
6 problem here. And my real question, I guess, is
7 -- and of course, the NRC can only do what the NRC
8 Charters asks it to do.

9 But I can't help but wonder if there isn't
10 a much, much bigger question out there when you start
11 talking about health and safety. And again, the
12 public is being led to believe, because of all the
13 attention we give to the nuclear sites, that this is
14 the problem, when in fact it may not be.

15 And I was just curious what -- and I
16 appreciate John's comment -- I'm just curious about
17 whether these other paradigms are having any attention
18 given to them in that regard. I'm hopeful that
19 somebody is trying to put this in some sort of global
20 perspective.

21 DR. JOHNSON: If I can just make an
22 observation on that. Even though the topic may be --
23 the words were institutional controls you know -- DOE
24 uses long-term stewardship. That's a broader -- it
25 just gives you the feeling that there's more to it

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1 than that.

2 And I think that certainly in our rule
3 that's the same situation. It's just not deed
4 restrictions, you know, we're talking about. It's
5 maintaining the effectiveness of those engineered
6 barriers over time.

7 But the importance I think in our process
8 is that the decommissioning plan needs to look at not
9 only the engineered barriers that should be proposed,
10 but how they should -- how monitoring needs to be
11 designed and how the effectiveness of those engineered
12 barriers over time, you know, need to be monitored and
13 maintained, you know.

14 So it's the broader picture and putting
15 that whole picture together in the decommissioning
16 plan to make sure that the designs for the engineered
17 barriers, the designs for the monitoring, designs for
18 the five-year rechecks are all done together, you
19 know, with the thought in mind up front to possibly
20 keep in mind that part of the engineered system is to
21 -- is that it has to maintain its effectiveness over
22 the time period.

23 So I mean, that's one good thing about
24 doing the planning all up front.

25 CHAIRMAN GARRICK: Yes.

1 DR. WYMER: You got any questions with the
2 staff here?

3 MR. LARSON: I thought the 500 millirem
4 requires a Commission decision that that's an
5 acceptable release, the release site. Isn't that what
6 the license termination rule requires? Don't they
7 have to make a decision of 500 or more? I'm just
8 looking at some of the --

9 MR. GREEVES: They have to consult with
10 the EPA.

11 MR. LARSON: All right. I can't --

12 MR. GREEVES: I don't -- you know -- the
13 regulation is what the regulation is.

14 MR. LARSON: Okay.

15 MR. CAMPER: I do want to -- you know,
16 Howard, I want to point out -- again, this is for Dr.
17 Garrick and Dr. Wymer, too. I want to make three
18 comments here. It gets back to the comments that Dr.
19 Wymer made about the question of hydrology and
20 engineered barriers.

21 And under the institutional control or the
22 strict release scenario bear in mind again that the
23 licensee has to demonstrate through its hydrologic
24 analysis, through its modeling -- and we have taken
25 steps recently to try to make the modeling approaches

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1 more realistic in bringing more probability to bear.

2 We've been constantly refining the codes
3 that we use. But the licensee has to demonstrate that
4 that site is at 25 millirem under the scenario that it
5 intends to leave it there, and that if those
6 institutional controls fail, if they fail, it's 100.

7 It's the safety cap of the 100 and 500
8 under certain circumstances. So and our staff, of
9 course, looks very closely at the proposed engineered
10 barriers, the hydrology analyses that are provided,
11 the dose modeling that's provided and so forth and so
12 on, to insure that the engineered barriers and all the
13 parameters the licensee is proposing for leaving that
14 site under restricted release will in fact insure the
15 25 millirem layer is met.

16 With regards to your point, Howard, I know
17 there's consultation that's required with the
18 Commission approval.

19 MR. LARSON: Okay.

20 MR. CAMPER: I have to really go back and
21 look closely at that.

22 MR. LARSON: And but as far as agreement
23 states are concerned.

24 MR. CAMPER: Come again?

25 MR. LARSON: As far as agreement states

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1 are concerned, if an agreement state decided that a
2 privately-owned facility was okay, I mean, that the
3 land and disposal?

4 MR. CAMPER: Yeah. I mean, you know, the
5 rule was in light of compatibility --

6 MR. LARSON: Right, that's true. Right.

7 MR. CAMPER: The rule was in light of
8 compatibility, of course, in the agreement states.
9 Now, they had the normal three years to implement the
10 rule. We have been pulsing them recently, a number of
11 meetings like the origination agreement states, and
12 CRCPD as to what the states are doing.

13 We're finding, of course, that they're
14 still early in the game, as well. But yes, I mean,
15 they could entertain a private scenario situation,
16 just as we could. Whether they would find it
17 acceptable or not, I just don't know.

18 MR. LARSON: Well, would we comment if
19 they proposed that in light of our own belief that it
20 should be a federal, state or local --

21 MR. CAMPER: Well, but again remember, we
22 would entertain, we would --

23 MR. LARSON: Okay.

24 MR. CAMPER: -- when MOLYCORP, that
25 proposed a private scenario, came in -- it was

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1 subsequently withdrawn -- we were going to evaluate
2 that proposal. And it doesn't have to be a
3 governmental entity.

4 It's preferable because of the longer term
5 -- the envisioned longer term stability of a
6 government as opposed to a private enterprise
7 scenario. But a private enterprise scenario is not
8 ruled out for consideration --

9 MR. LARSON: But we had a proposed rule-
10 making for private enterprise and we withdrew it.

11 MR. CAMPER: Well --

12 MR. LARSON: Seven or eight years ago.

13 MR. CAMPER: Yes, but we -- under the LTR,
14 we've not yet taken one all the way under the LTR,
15 under the license termination rule.

16 DR. WYMER: Any other comments,
17 observations?

18 (No Response)

19 DR. WYMER: If not, well, thanks. It's
20 good to get this very early in front of briefing on
21 this because I think it'll become a hot topic as time
22 wears on. So we'll look forward to having continuing
23 input from the staff here on this.

24 MR. CAMPER: Thank you. And we suspect
25 we'll come back to you and talk more about this again

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1 as we work our way through it.

2 DR. WYMER: We would anticipate that, yes.

3 MR. CAMPER: There's going to be a lot of
4 lessons learned, and we'll be back to you.

5 DR. WYMER: Now, before we turn to the
6 next presentation I'd like to make a little personal
7 aside here. We have two representatives of the
8 National Academy of Sciences here, Tom Leschine, whom
9 you'll hear from in a few minutes. Oh, three.

10 And the senior staffer who was the
11 responsible Academy staffer on this committee that
12 turned out the report on institutional management, Bob
13 Andrews, who will soon be in that enviable state of
14 grace known as retirement.

15 MR. ANDREWS: Like you are.

16 DR. WYMER: Yes, like I am. And of
17 course, the ever popular Bob Budnitz, who are all
18 sitting over here. So okay. I wanted to get the
19 little personal things out of the way here.

20 So now, let's go ahead and hear from Tom
21 about the Academy Report.

22 CHAIRMAN GARRICK: He's ready to go and
23 plug it right in for you.

24 (Pause)

25 DR. LESCHINE: Okay.

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1 CHAIRMAN GARRICK: While we're getting set
2 up here it's important to point out here that not only
3 do we have with us today the Chairman, Tom Leschine of
4 the current form of the Committee, but we have the
5 last Chairman, Bob Budnitz.

6 So we have a lot of experience and
7 continuity here, that of course, as Ray said, we have
8 the staff member that has been through this for many
9 years. So we welcome you all here.

10 (Pause)

11 DR. WYMER: While we're waiting for our
12 high technology stuff to kick in here, let me go ahead
13 and introduce Dr. Tom Leschine, who was the Chair of
14 quite a long-running Committee that produced this
15 report on institutional management.

16 And subsequent to the publication of the
17 report has been subjected to numerous inquiries by the
18 press and various organizations and has had to commit
19 himself to many statements that he probably would have
20 rather not made.

21 (Laughter)

22 DR. LESCHINE: Yes, I could tell some
23 stories.

24 DR. WYMER: But anyway, it was a long,
25 drawn out process and many facets of the problem were

1 considered and they -- what I think was a very
2 creditable report was turned out by the Academy.

3 DR. LESCHINE: This is it. I don't know
4 if you got copies. I saw something in e-mail.

5 MR. CAMPER: Yes, we all got copies.

6 DR. LESCHINE: Okay.

7 DR. WYMER: The Academy was kind enough to
8 present it to all members.

9 DR. LESCHINE: I'm not sure what you
10 really want me to do here. So I have kind of too many
11 pictures and I could, you know, spend a lot of time
12 walking through a lot of conceptual ideas that we
13 developed. I think you should hear some of that.

14 And as I was listening to the last
15 session, I guess the things that I might not have
16 emphasized too much that are, in fact, at the -- kind
17 of at the end of the talk are our findings and
18 recommendations and, you know, what are some of the
19 issues within.

20 The issues are sprinkled throughout my
21 talk and then we come down to maybe what really just
22 reinforces them. So what's your pleasure? You like
23 dialogue? How should I --

24 DR. WYMER: I think the conclusions and
25 recommendations are a key part of what you're going to

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1 give us, but let's hear the whole story.

2 DR. LESCHINE: Okay.

3 DR. WYMER: Especially some of the
4 concerns about the durability of institutional
5 controls; I think, Tom, some of our -- the Committee's
6 concerns about just how long can you rely on various
7 institutions.

8 DR. LESCHINE: Yes. Just in what I heard
9 in the few minutes that I was listening in on the last
10 session, I'll try to talk about some of those issues.
11 These are not technical difficulties. We need a
12 different term. These are just technical --

13 DR. WYMER: Glitches.

14 DR. LESCHINE: No, they're -- see, we need
15 a positive of, just what you have to do. It's the
16 price you pay.

17 DR. WYMER: Well, you've got three minutes
18 before your scheduled, anyway.

19 DR. LESCHINE: It's a type of Faustian
20 bargain, maybe, the one with technology, as opposed to
21 the one we quoted here from Alvin Weinberg.

22 MR. ANDREWS: Ray, if I may, you might
23 introduce Tom in terms of being a professor of marine
24 policy at the University of Washington. And this was
25 a very unusual study for me at the Academy, since we

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1 had a blend of physical scientists and social
2 scientists.

3 And we found that communication between
4 these two groups is very difficult.

5 DR. WYMER: I was going to question your
6 word "blend."

7 MR. ANDREWS: Each side accused the other
8 of being ambiguous, muddle-headed and everything else.
9 But it made for a very interesting study and it's
10 -- this is not just a science and technology issue, as
11 we found. We have to deal with people, as well.

12 DR. LESCHINE: Yes. We discovered if you
13 take a long time, longer than the Academy would like,
14 and especially the sponsor, and you spend all your
15 money and more, you can really get the two groups on
16 the Committee to come together, and the social and
17 natural science technology and human dimensions,
18 really, to come together in what I think is a very
19 coherent report that does this better than I've seen
20 it happen before. So I hope you'll see that reflected
21 in what I'll talk about. How we doing?

22 CHAIRMAN GARRICK: Go ahead and open it.

23 (Pause to set up computer)

24 CHAIRMAN GARRICK: Are we ready to go on
25 the record?

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1 DR. WYMER: Looks like it.

2 DR. LESCHINE: Okay. We're set.

3 CHAIRMAN GARRICK: All right.

4 DR. LESCHINE: Maybe I should sit down.

5 Well, I'll be in your way. I'll walk. I'll stand up.

6 It's a pleasure to be here. I am not so
7 familiar with the issues of commercial nuclear power
8 plants, but I recognize that in the broad outlines
9 many of the questions are the same.

10 And, you know, I already picked up in this
11 short time that I sat here this interesting question,
12 which is one that we've had to deal with in our study
13 at the National Research Council, as well.

14 And that's when the commercial sector
15 comes into things, because even though, you know, we
16 look at nuclear power as a kind of commercial
17 technology and we think of DOE sites as quite the
18 opposite, we've got all kinds of ideas like re-
19 industrialization around the fringes of the DOE sites
20 that mean that, in fact, it's possible that commercial
21 interests will be the ones doing long-term stewardship
22 at some of those sites, as well.

23 So there's an interesting nexus here
24 between those two. Well, I already told you some of
25 the dilemma, but I will, you know, try to march

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1 smartly through some ideas to make sure that you
2 understand the conceptual foundations of this study,
3 because it was very important to our thinking about
4 really there being a couple of fundamental issues that
5 we think are pretty insoluble at the moment that I
6 heard echoed in the brief discussion beforehand, as
7 well.

8 And I'll tell you in advance what they
9 are: that science and technology is really wanting,
10 and yes, we need those models to tell us where
11 contaminants are going to go and what long-term
12 contaminant concentrations are going to be, because
13 that's the basis of our institutional control design,
14 and those models are not really up to par that we have
15 to rely on.

16 And the second problem is the social and
17 human dimension. It's one thing to say we'll have
18 institutional controls. It's another thing to
19 guarantee that they will be in place, and I think
20 that's going to become a very big issue.

21 So this is the Committee and you already
22 heard that we're very pleased to have our former
23 Chair, Bob Budnitz, because this Committee, unlike
24 most National Research Council Committees, was set up
25 actually as Standing Committee, and we did five or six

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1 different reports.

2 I should mention that Bob Andrews, our
3 retiring Staff Officer -- well, we did quite a few on
4 this Committee. We did a report on the Hanford tanks
5 that I think was very prescient where we saw nothing
6 but trouble in the privatization initiative that DOE
7 was undertaking, but nobody listened to us.

8 So and we did a very nice study that Ray
9 was really involved in on the Niagara Falls storage
10 sight. So these were all in the history of this
11 Committee when Bob Budnitz was the chair. I took on
12 the chairmanship after him, and the Committee left as
13 a Standing Committee, I guess I'm presiding over the
14 end of now, but that's how things go.

15 But that's another comment on our -- the
16 world we live in with institutional longevity. So the
17 Committee members are here, just to make the point
18 that there was an interesting balance, very strong
19 representation on both the natural and the social
20 sciences on this Committee, much more-so than in my
21 experience with other National Research Council
22 Committees.

23 And by the way, way down at the bottom we
24 have the redoubtable Bob Bernero, who was our
25 consultant. And so I didn't have to know anything

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1 about regulations, because he knew everything that
2 there was to know about regulations.

3 Our charge is worth considering because we
4 thought we were the masters of our own destiny and
5 Chairman Budnitz very astutely was negotiating what
6 this standing committee would do next as he left the
7 scene.

8 And we actually wrote the original charge
9 and proposed it to DOE, but it went through the mill
10 of the Academy and DOE repeatedly, and to Al Lamb's
11 office and to Tom Grumley and back again. And by the
12 time it came back to us it ended up with a rather odd,
13 you know, assess approaches for developing the
14 criteria, don't just develop the criteria.

15 Don't state what the approaches are,
16 assess the -- it was a little confusing. But it made
17 us realize that what we needed to do was to start from
18 a conceptual place. In other words, think of this as
19 a conceptual problem and don't just rush into
20 -- tempting though it might be, let's look at all the
21 institutional controls that EPA has imposed, because
22 there's a wealth of experience there, and let's go
23 down the road that way.

24 So we spent a fair amount of time looking
25 at the end of this statement in trying to come up with

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1 a conceptual model for long-term stewardship planning,
2 if you will, that would encompass all the things in
3 the charter as we were given it, so that at the end we
4 could say something about appropriate criteria.

5 That's how we approach this job. So what
6 we gave back as an answer is a report on stewardship
7 that avoids using this word "stewardship" that has
8 become very current in DOE. We call it long-term
9 institutional management.

10 It's somewhat of a redundant term, in
11 fact. But we've -- because management is by
12 definition an institutional enterprise, right? But
13 our purpose was to really underscore the importance of
14 institutional reliability in the management that
15 occurs.

16 And as you can see from this list of --
17 you know, these characteristics are very general --
18 that we're thinking in a broad, systematic,
19 integrative, iterative way. And you can see in this
20 our conclusion that only this kind of approach,
21 really, do we think will work.

22 And in fact, if you knew the work of this
23 Committee, I think the consistent theme in all our
24 work, Bob, was that every study really said, you've
25 got to look at things in a big, broad, integrative

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1 way.

2 We can't look at these K-65 wastes at
3 Niagara Falls and not think about what we're doing at
4 Fernald because we've got a very similar situation
5 there. And we were always trying to fight against I
6 guess what is sometimes called stove-piping in the
7 Department of Energy, where problems tend to get
8 single processed without much learning across the
9 boundaries.

10 So we think this is a situation where
11 learning is really going to be at a premium, and
12 that's why we went in that direction. Let me -- we
13 have a number of side bars in here and this is my
14 favorite.

15 It came out of a master's thesis of a
16 student at the School of Marine Affairs where we do
17 nothing nuclear, except Ann Ballou was very interested
18 in what happened to all those Pacific islands and all
19 those marine resources where all the atomic testing
20 took place, and she wrote her master's thesis on that.

21 There's a very interesting, I'll call it
22 a moral tale, in Bikini, because if you know the
23 story, we did a lot of testing there and Bikini was
24 resettled probably a little bit before it should have
25 been resettled.

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1 And in fact, the old Atomic Energy
2 Commission resisted the resettlement of Bikini, but
3 the natives went back anyway. This is a story from
4 the New York Times, which is very recent, and it is
5 literally true.

6 And what is interesting about Bikini is
7 all the mistakes you can make, and I think are still
8 very vulnerable to, were made then. We did let 167
9 people resettle the island of Bikini, but on an
10 understanding that turned out to be erroneous in two
11 ways.

12 The first point was that modeling was done
13 to determine what kind of doses people resettling the
14 island would receive under various scenarios, and the
15 modeling was in error. The modeling was based on
16 terrestrial soils, continental soils, not islands in
17 the Pacific.

18 And the relative lack of potassium in the
19 real soils meant that cesium, which covered the place
20 basically, was readily available for uptake by coconut
21 palms. Okay. So we sort of understood the mechanism,
22 but not the degree to which that was really going to
23 occur.

24 And we told the Bikini Islanders, you can
25 go back, and we shook our fingers at them and said,

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1 but don't eat the coconuts. But they did, okay, and
2 they did because this is everything to their life.

3 It's the symbolic connection to their
4 homeland. It's the most important food. These are
5 Marshall Islanders. These people in the Pacific eat
6 coconuts. So they did eat the coconuts and they did
7 very quickly develop these body burns.

8 This was an early attempt at risk
9 communication before there was even the term, right?
10 So we got it all wrong. We just told people once who
11 didn't even understand what the real risks were, what
12 -- how they should control their behavior.

13 We didn't really monitor. But then we did
14 something right. We also had medical monitoring.
15 Every single person that went back was required to
16 take a physical exam every year, and it was this
17 medical monitoring that picked up the signal, okay.

18 So another kind of lesson comes out of
19 that, a sort of wrong scientific model, an
20 inappropriate control message, but a system of
21 control, of management, if you will, that had this
22 component of layering in it, redundancy, right?

23 Medical monitoring was an additional
24 measure put on top of the idea, don't eat the coconuts
25 and rely on foodstuff from off island, okay. Now, you

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1 know, easy to look back and draw a lesson on something
2 like that, but that's a difficult thing to do and this
3 is one of the institutional challenges.

4 You know, what you're going to be asked to
5 do is to assure that the institutional controls put in
6 place will be effective. What's that medical
7 monitoring doing? Is that sort of betraying that
8 there's doubt about the -- you know -- there's this
9 difficulty that we might call political that will be
10 faced by people that try to do these kinds of things
11 and it's something to really take into account.

12 So we took out of this the idea that we
13 shouldn't talk about stewardship. We should talk
14 about something that is a different term that we kind
15 of invent in the report. And here's our problems with
16 stewardship.

17 So what I want to do for a few minutes is
18 talk to you about this word that's just all over the
19 place in the Department of Energy right now, long-term
20 stewardship, already been reduced to an acronym, LTS.
21 Okay.

22 Well, there's a lot of problems with it.
23 The activities, institutional controls do not equal
24 long-term stewardship. Stewardship is a management
25 function. Institutional controls are a set of

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1 measures that are part of that system; essential
2 distinction.

3 And also, this idea that stewardship is a
4 nice-sounding word and it becomes all things to all
5 people, and that can be its undoing. So in fact, I
6 went to -- DOE has a brand new website, energy.gov,
7 and they have -- oops. What did I do.

8 More technical problems. The Department
9 of Energy website has a stewardship category. And I
10 was two minds about this. What else is there -- in
11 back of mine? Okay. Here we go. Okay. On the one
12 hand -- you hear me fine?

13 Okay. Well, on the one hand I like the
14 idea that stewardship is getting very prominent play.
15 On the other hand, applying it to all these very
16 disparate activities, will the real essence, the gem
17 of what I think needs to occur really be maintained
18 when stewardship applies to everything?

19 And by the way, what's missing here?
20 Stockpile stewardship. It's another term they use,
21 right? That's their word, and it's not even on this
22 list. And if you saw the newspapers or maybe the
23 report, they're really being blasted for their, you
24 know, failed stockpile stewardship, according to the
25 GAO or somebody.

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1 So you need to think about this term and
2 recognize -- this is something I made up -- this is an
3 old, old term that has a lot of meanings, and not the
4 meanings that we're now investing in it. I would
5 argue that real stewardship is out here.

6 I don't know if you're familiar with Aldo
7 Leopold, but kind of the birth of the model
8 environmental movement in these very lyrical essays he
9 wrote, "The Sand County Almanac." He coined the term
10 "land ethic," you know.

11 And between that and Gifford Pinchot's
12 conservation management, I'll spare you the details on
13 his school of natural resources, this is the
14 difference between Bruce Babbett and Gail Norton,
15 okay? This is a huge --

16 (Laughter)

17 DR. LESCHINE: -- this is a huge
18 ideological divide about what you do with forest lands
19 and whether the purpose of why stewardship is
20 productive use of environments versus leaving them
21 alone, right.

22 The wilderness concept versus the well-
23 managed forest that produces timber, fish, wildlife,
24 et cetera. And I would argue that reuse and re-
25 industrialization, DOE terms on what we're going to do

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1 with surplus sites and facilities are, you know,
2 moving along further still.

3 And protection from harm, DOE's idea, is
4 really way over there, especially by comparison to
5 this, okay? So you have a term which has a lot of
6 different meanings to different people.

7 And I'm a professor of public policy, and
8 let me just say that when you're in that kind of
9 situation you tend to get a lot of conflict because
10 people have different ideas about what they think
11 should go on.

12 So EM, you know, Department of Energy has
13 this kind of institutional controls, and stewardship
14 after remediation is pretty much the concept. And
15 yet, part of what we're saying in the report is that
16 stewardship has to be part of remediation, has to be
17 part of remediation planning, in fact, has to be part
18 of construction of waste management facilities and
19 maybe in your world, reactors in the first place.

20 You build the reactor with the thought of
21 how you're going to decommission it. Maybe the
22 commercial nuclear power world does better at that
23 than we did in the DOE world.

24 But you know, hey, taking those kinds of
25 considerations into account right at the beginning so

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1 that you have a continuum between operations and
2 decommissioning, and then dealing with the wastes is
3 essential.

4 Here now are some of what our report said,
5 and we said that, you know, it's basically echoing
6 what I'm already saying, stewardship has to be a
7 pervasive concept and waste management -- today's
8 waste management has to become part of tomorrow's
9 stewardship planning.

10 So I just want to point out, the
11 Department of Energy has itself changed its story
12 quite a bit, and this is what Hazel O'Leary was
13 saying. She was giving -- she was using the term
14 "stewardship" about this report, called "Stewards of
15 a National Resource."

16 This was right at the point where we were
17 starting to talk about deaccessioning a lot of
18 surplus lands and facilities, and noticed that it's
19 a very Aldo Leopold like concept, and it's only under
20 Secretary Antune (phonetic) that stewardship has
21 become associated with this idea of long-term care and
22 so forth.

23 So this doesn't come through very well.
24 It's in the report. This is the Alan Croft diagram.

25 DR. WYMER: Yes.

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1 DR. LESCHINE: This is our model for long-
2 term stewardship, our conceptual model. This diagram
3 appears in the report. We adopted the idea of a
4 three-legged stool.

5 I think it was, well, came out of a
6 Committee meeting where the idea is that you have
7 stewardship activities on one leg, okay. And I'll
8 talk about what those activities are.

9 They include but are not limited to
10 institutional controls. You have contaminant
11 isolation on another leg. You have contaminant
12 reduction on the third leg. It's a package. It's
13 three things.

14 They form the configuration of a stool.
15 They support an end state. I'm looking at John
16 Garrick as I say that because he's been the crusader
17 constantly for the idea that you can't do management
18 and clean-up at DOE sites and not have an end state in
19 mind.

20 It's very important that you have one,
21 even though it might change, but that's the nature of
22 things. And the idea here of the rungs is that this
23 is an iterative process. We're not going to get there
24 in a day.

25 There's a guy -- you know -- Milton

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1 Russell's talking about rolling stewardship, the idea
2 that you put a set of controls in place today and you
3 keep those controls going into the distant future, but
4 you keep revisiting them, keep changing them, you
5 don't expect to be able to -- you don't expect to put
6 anything in place for 1,000 years.

7 You expect to put something in place and
8 start revisiting it right away and see how it's
9 working and make adjustments as appropriate. But
10 maybe those adjustments are more clean-up in the
11 future, because you realize you can't really sustain
12 the system you're trying to retrain, and you've got to
13 get rid of the waste or build a better cap or deal
14 with the fact that the cap is failing or will fail,
15 and take other measures.

16 So there's also a lot of terminology that
17 relates to the fact that these decisions that are made
18 at every stage, we call them contextual factors,
19 they're represented on the rungs, is costs and risks
20 and life-cycle analysis and all kinds of things,
21 political factors, what stakeholders want, community
22 aspirations.

23 All that stuff in the case of a DOE site
24 is really going to figure big time. In fact, any
25 federal facility, I would argue, because the federal

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1 government has taken this notion that, you know, we
2 don't take -- withdraw lands and facilities and hold
3 them forever.

4 We've got the idea that they go back to
5 the people at some point. So there's this -- and also
6 this notion of perpetual responsibility for any hazard
7 we create. So you've got an interesting kind of a
8 problem.

9 It's really built into our notion of
10 governance in this country, and that is the federal
11 government on the one hand has the duty to return
12 things to the people, return things to productive use
13 in the economy.

14 On the other hand, it has this
15 responsibility for perpetual care of the problems that
16 the federal government has created. So if you're
17 thinking that way about nuclear power plants, you see
18 the same kind of dilemma in a way, but it's certainly
19 built into the DOE world.

20 So the tools, I've kind of mentioned this
21 already. But I guess my real point here is to focus
22 on the stewardship measures and the fact that
23 institutional controls, which are use and access
24 restrictions, basically, that's the primary tool and
25 that's where EPA always goes in these CERCLA-type

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1 cleanups.

2 That's really only one part of the story
3 of stewardship from our perspective, and the rest of
4 the story is all of these things which -- I guess the
5 point I want to make here now is that this list is
6 kind of organized on a continuum -- it's discussed in
7 the report -- that goes from sort of the familiar and
8 the accepted to things that we think are necessary,
9 but not considered by most people, and certainly not
10 by DOE as part of what they're up to.

11 So yes, institutional controls,
12 monitoring, surveillance, oversight and enforcement,
13 we talk about that all the time, and yes, we're
14 talking about the necessity of maintaining information
15 and very good records on contamination.

16 This is a very essential feature of
17 anything you're going to hand off to the future. But
18 then we get into things that it's not so clear
19 anybody's committed to do. Is the Department of
20 Energy really committed to periodic reevaluation of
21 the whole site protective system?

22 What I know about that is that DOE is
23 looking very carefully at its legal responsibilities.
24 It's not clear the extent to which they or anybody
25 else is required to do this. We'll probably see some

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1 congressional action, I would think, that takes on
2 this question of clarifying responsibility for the
3 waste, but there's not necessarily responsibility for
4 the situation in which the waste is left.

5 And then we would argue more radically
6 still, you've really got to keep looking at technical
7 options. You can't say the problem you couldn't fix
8 in 1990 is one that you don't have to fix in 2020, or
9 ever, because you didn't have the technology then.

10 So we think that it's important not only
11 to be passive here, but really force the R&D. So if
12 the Department of Energy, you know, they have this new
13 technology program emerging at the Idaho site, INEEL,
14 and I would guess and hope that that's sort of the
15 orientation.

16 Some people are a little bit skeptical,
17 but that's the idea, that they should be pushing
18 towards what we'll call stewardship technologies,
19 which are remediation technologies at large, let's
20 say.

21 So to talk about the R&D a bit, you have
22 to have it. Your technical capabilities are
23 deficient. We don't understand sites and residual
24 contaminants very well, and I want to show you some
25 -- I'll stop showing you lists and show you some

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1 pictures in a minute.

2 But there's two issues here. We don't
3 really have as much knowledge as we should about the
4 bio-geophysical character of sites. Surprisingly, we
5 don't know much about the subsurface where all the
6 wastes are, especially, and in some cases even the
7 contaminants themselves.

8 Not that we don't understand radio
9 nuclides, but radio nuclides in the complex site
10 environments can sometimes be a problem. And then,
11 you know, and this is very much consistent with the
12 spirit of this report, we extend that list right into
13 the demographic and social dimensions.

14 In fact, what we're saying is we do have
15 to understand. We went to the Nevada test site and
16 started asking questions about what if Las Vegas needs
17 water? Well, you know, they'll find water up north,
18 not a problem.

19 This is the fastest growing city in the
20 country. Is it really not a problem that there's a
21 lot of contaminated drinking water 100 miles north of
22 Las Vegas, the fastest growing city in the country in
23 a desert, and the biggest user of water on a per
24 capita basis by far of any city in the country, and
25 this bugaboo of how well institutions really can

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1 perform.

2 We just want to kind of assure people we
3 will perform and not really look at what adds up to
4 effective performance. So the science and technology
5 issues, then, really relate to understanding long-term
6 risks and conceptual modeling.

7 And I think I reversed the order of these
8 two things; I did. I want to talk about this because
9 this is the undercurrent of this whole -- what I heard
10 you talking about, you know, how do you assure that an
11 institutional control is going to achieve a numerical
12 standard, whatever that -- 25 millirem or 15 millirem,
13 like we're using at Hanford for the clean-up of soils
14 along the Columbia River.

15 The fact is, we are finding surprise after
16 surprise in that the contaminants that are released
17 into the environment are not behaving as expected.

18 Technicium, appearing in the -- under the
19 tank farms at Hanford, plutonium well down the
20 gradient from the test site at Nevada, the Benham
21 test, and plutonium migrating at the Rocky Mountain
22 -- sorry -- Rocky -- that place, RWMC in Idaho.

23 Subsurface could -- you know -- you know
24 where this stuff comes from. It's a much bigger
25 problem at DOE sites than at the typical nuclear plant

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1 with all that stuff everywhere.

2 But this is a very -< this is borrowed, by
3 the way, from Jane Long in another National Research
4 Council study, a very nice study, Research Needs in
5 Subsurface Science. She was the Chair of that study.

6 This is the changing view of how long it
7 takes radio nuclides to get to the Snake River from
8 the Idaho RWMC. And what's happened here is going
9 back in time to the 1960s, a four order of magnitude
10 change.

11 We used to say they don't move, takes
12 70,000 years. We're saying now, they can under some
13 circumstances move in mere tens of years. This is a
14 -- basically, what we're learning is that we had a
15 casual, naive conceptual model of the site.

16 The model wasn't really tested by reality
17 or data, and when we started to do that, which is now
18 happening, we're discovering that things are quite
19 different than they were in the past.

20 So this other report, Research Needs and
21 Subsurface Science, has a very nice discussion in it
22 of the problem of site conceptual modeling, something
23 that was represented in our Committee by Schlomo
24 Neuman, who insisted that our report had to really
25 emphasize this, a very nice discussion of what the

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1 need is, what the requirements are, what the standards
2 should be.

3 So you know, I don't need to show you too
4 many pretty pictures, but this is the estimate of the
5 new picture of the Hanford Tank Farm, with cesium and
6 other contaminants distributed at depths, cesium-137.

7 And you know, this is also the reality.
8 Again, Hanford is the worst site in the complex, and
9 I'm from Washington State, so this is the one we think
10 about a lot. And here's the radio nuclide tritium
11 contamination above drinking water standards.

12 And you know, I mentioned this kind of
13 interplay between the human and the technical, and I'm
14 about to switch. So I want to point out, here's the
15 old Hanford town site. As Bob Andrews was pointing
16 out, there's not much there but it's a historic site
17 and people like to visit it.

18 And what's our President Clinton been
19 doing in his waning days? I heard he did a bunch more
20 this morning. He's creating national monuments all
21 over the place and is trying to hide this stuff from
22 the Republicans so they don't cut all the treaties, I
23 guess.

24 (Laughter)

25 DR. LESCHINE: But here's the Hanford

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1 Reach National Monument, the Bruce Babbett vision of
2 stewardship, right. And notice, this is the proposed
3 boundary. You see that lobe? Okay. Well, that's so
4 the people can visit the Hanford town site, though.

5 So you know, I know that contamination is
6 in the subsurface and we don't really expect the
7 average national monument visitor to put in a well.
8 But you know, do we really understand all the
9 mechanisms that could bring contamination to the
10 surface, taproot plants with 12-foot taproots, the
11 typical sagebrush that lives in the desert, which this
12 is.

13 You know, these are the kinds of questions
14 you have to start thinking through so you don't
15 recreate Bikini and the coconut trees. So let me talk
16 about long-term risk, a little bit at my peril because
17 John Garrick's sitting here and he's the guy who
18 clarifies completely the discussion of risk.

19 But the way we see it is this way. You
20 know, it's a question of stewardship technologies in
21 looking at who's going to use them, how they'll use
22 them, will they use the technology if it's intended to
23 really be a protective technology.

24 And very importantly, who else out there
25 might do something that would change the way our

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1 protection system might work? These are questions
2 without answers, and the message of our report is,
3 somebody's got to get into the business of starting
4 the research and looking seriously at answering these
5 questions.

6 So the groups that we're thinking about
7 now are not just the agency people administering the
8 institutional controls, but certainly it includes
9 them, the long-term stewardship managers, employees,
10 overseers.

11 What other agencies, as well? Agencies
12 that DOE is not necessarily used to thinking about as
13 kind of partners. This is a very good news/bad news
14 story.

15 As I was telling it, I was meeting with
16 Gerald Boyd, because I'm part of this Press Program if
17 you know about that, a few weeks ago, and telling him
18 about the good news at Hanford when the fires blew up
19 last summer and led to the near catastrophe there,
20 people in the community were not blaming DOE.

21 They were blaming the Fish and Wildlife
22 Service. That's really unique in DOE's experience
23 that something involving radio nuclides happened and
24 they didn't get the blame for it. Well, you know, the
25 story there is that if you're going to have a

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1 wilderness area next to a hazard, that wilderness area
2 gets managed, too.

3 And do we manage these sites in ways that
4 prevent fire or do we have -- you know -- what did we
5 learn out of the Yellowstone fires. You know, I'm a
6 westerner, a land -- not -- from Pittsburgh but a
7 westerner now, right.

8 And these big land management issues loom
9 large, and after the Yellowstone fires we decided the
10 fire policy is let it burn, that fire is part of
11 nature's intention that renews forests and ecosystems,
12 and is an essential part of those systems.

13 So that's what you get from the Aldo
14 Leopold way of thinking now, but fires that are
15 unchecked in the vicinity of hazards are fires that
16 can be very dangerous, and we sure found this out at
17 Los Alamos, as well, right.

18 So you've got a conflict between two
19 ideals, separate managers. Somebody's going to have
20 to work that out. The public certainly is very
21 important and users and visitors have been hinting at
22 that.

23 So we're worried about things like water
24 and water demand. Again, in the west where a lot of
25 the biggest hazards are, that's where the water issues

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1 loom very large. Development encroachment is very
2 important, and that's true in many of the eastern
3 sites.

4 Mound and Fernald are really good examples
5 of that. The industrial, commercial and residential,
6 recreational use that we're inviting onto the sites,
7 right.

8 What we're talking about doing in Oak
9 Ridge at the East Tennessee Technology Park is re-
10 industrialization where facilities that were formerly
11 used for, you know, weapons production get turned over
12 to the private sector for use, and they're not
13 facilities that are scrubbed free of any
14 contamination.

15 And then the learning aspect becomes very
16 significant. So here's some of the lessons that loom
17 large to us. Looking at sites -- so this comes right
18 out of DOE's own report from clean-up to stewardship.

19 Rocky Flats, 1940. Here was Denver and
20 here's Boulder, I guess, and here's Rocky Flats today
21 and this is, you know, the kind of stuff you get off
22 of a LANDSAT image, that's how this was created, of
23 how growth and development has changed.

24 So if you've been to Rocky Flats, it's
25 obvious to anybody driving down that road there's an

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1 awful lot of housing right there nearby. And this is
2 a site which is -- you know -- DOE creates a vision of
3 it in a kind of computer animation that shows
4 buildings disappearing and a green field, basically.

5 But you know, Ray was using that term and
6 that's one we thought about in this report, too. You
7 know, what does it mean to call something a green
8 field? It really doesn't mean that what you see is
9 green grass. It means it's free of contamination.

10 Well, Rocky Flats will be the green grass,
11 but by no means free of contamination. So and this
12 is, you know, with the encroaching settlement. So
13 these kinds of issues really have to be looked at.

14 I also wanted to show you a couple of
15 pictures from Hanford again, because the way that we
16 think about sites -- you were talking about EPA -- you
17 know, tends to be in a very management-driven way.

18 And what's interesting about Hanford, we
19 see maps like this all the time. You know, what is
20 the 100 area at Hanford? Is there a boundary line?
21 Is there something you can see from a satellite?
22 There's not -- this was an operational term.

23 It was meant to be cryptic, you know. It
24 was created during the war, the 100 area, the 200
25 area. Something went on there, you know, take this

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1 stuff over to the 200 area. Don't -- whatever you do,
2 don't open the doors in the back of the truck.

3 So these were operational designations and
4 it's how we're used to thinking about our sites. And
5 we bring in somebody like EPA and we start targeting
6 a clean-up.

7 And this is one that I've been looking at
8 through my involvement in the Press Program, you know,
9 playing the game of CERCLA, which is a dice and slice
10 approach. It's a reductionist approach that I would
11 argue drives us away from the big picture of what
12 we're really trying to do.

13 And I think that's something really
14 important. So you get, you know, all these reactor
15 areas, and you've got all this contaminated
16 groundwater. But you know, the approach with CERCLA
17 is basically, take the problem down to its smallest
18 relevant scale and deal with every single facility,
19 pipeline, et cetera, on top of this mass of
20 contaminated groundwater that we really don't have any
21 way to do anything about, right?

22 So what's interesting there is we start
23 imposing, you know, the devil's in the details. But
24 let me just say, the institutional controls that have
25 been created in associated with soils clean-up

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1 deliberately are created in a way that ignores the
2 reality of this contaminated drinking water plume.

3 In other words, we're only asking the
4 question, what minimizes the contribution from this
5 site to the drinking water as if it were
6 uncontaminated because we're trying to, you know,
7 remove every iota of contamination.

8 And we're doing that in a way where we are
9 actually, in order to kind of force the removal of
10 contamination, we're using a residential scenario
11 here. So the thought here is residential, and the
12 whole construction of institutional controls is
13 oriented toward this notion of residential use which
14 will never occur.

15 And people think that's a good thing
16 because it's a high standard. I argue it's a bad
17 thing because it's preventing you from thinking about
18 what really will occur and whether you're really being
19 protective about that.

20 So you're not protective by creating
21 little holes where you're cleaning up these little
22 individual sites that are very clean to a residential
23 use that could never be supported because of all the
24 other hazards in the area.

25 So no one would ever -- you'd never want

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1 anybody to live here, but is the area really being --
2 are you doing the best thing to make the area safe for
3 the uses that are likely to occur? That's the
4 question that seems to us to not be getting approached
5 through the kind of things that we're doing in our
6 most dominant cleanup strategies.

7 So you end up with that. Swiss cheese,
8 basically, we have excised some holes. We've created
9 some brown fields, and that's the world we're going to
10 try to live in.

11 And I guess I'll just -- I've switched now
12 to Savannah River and I've borrowed this slide from
13 Chuck Powers and, boy, it doesn't show much. But I
14 made that point about looking at sites in operational
15 terms over and over.

16 You know, every maps shows the 100 area
17 and the reactor sites. This is a aerial photograph of
18 the Savannah River site, and here's the Savannah River
19 site boundary. And this is, I think, Steel Creek and
20 supposed to show -- doesn't show very well -- but it's
21 supposed to be cesium concentrations in surface
22 sediments in the creek.

23 And what you see here in the aerial
24 photograph is an active working farm snugged right up
25 against the site boundary. Well, I argue -- we argue

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1 -- there's a reality in this kind of image that you
2 just don't quite get to when you keep looking at
3 things in regulatory-driven and sort of operational
4 terms.

5 You're not really looking at who your
6 neighbors are and what's likely to happen, like if we
7 change this boundary. You know, should this boundary
8 actually be pushed out so that we don't have a farm
9 here for the institutional control period at this
10 site?

11 And those are the kinds of questions we're
12 not asking, and I know that if you -- because I've
13 been to the 100 area at Hanford, and if you go to the
14 -- so if you haven't been there in awhile you might be
15 surprised, because if you stand there at the end
16 reactor or any of the others and look out across the
17 river, what you see marching down the other side of
18 the river are vineyards.

19 The Washington Wine industry is booming.
20 It's really hot stuff. Everybody's planting
21 vineyards. No pun intended, but you know, even the
22 perception that there's contamination that's affecting
23 those grapes, and perception, not necessarily reality,
24 would be a financial disaster to the agricultural
25 sector in Washington State.

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1 And a downstream view, too, this is part
2 of the story right off site, the fact is, there are
3 off site affects, and I think any reasonable
4 institutional control, stewardship planning has to get
5 serious about those.

6 This is fish consumption from the Savannah
7 River, a study done by Joanna Berger, who's at Rutgers
8 University. And her point was, she interviewed
9 fishermen, intercepted them and talked to them and
10 went to their homes and interviewed them about their
11 fish consumption, and found that the EPA model is
12 assuming 19 kilograms per year consumption.

13 And this is actual consumption and here's
14 50 over here, and you see that there are some
15 consumers of the fish caught in this river who are
16 well, well over those assumed limits.

17 So again, you know, the kind of artificial
18 constructs we're using in our risk modeling aren't
19 necessarily verified by empirical reality. And if
20 we're really going to be protective at these sites,
21 we're going to have to change those things.

22 Well, I think what I ought to do is --
23 let's see where we are. I'm inclined to sort of --
24 I've talked enough, I think -- to rush toward the --
25 rather than -- let me just tell you what we did.

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1 I'll summarize it briefly, you know, and
2 I'll show yo some of the things, because you've
3 already seen some of the recommendations from the
4 report. We did come up with -- we would say our
5 report is a blueprint, that we talk about these tools
6 that the -- are available to site managers, you know,
7 isolation barriers, remediation as a stewardship tool,
8 and institutional controls and other stewardship
9 measures.

10 The contextual factors, the ways and risks
11 and costs and political accountability and so forth
12 will shape and constrain the decisions at site. And
13 then what we do in our report is talk about these
14 desirable characteristics of institutional control
15 systems.

16 This is our coming back to the criteria
17 question that was part of the charge, and then our
18 generic design and implementation criteria and some
19 recommendations and so forth. So let me finish up,
20 then, by just talking briefly about some of these
21 things.

22 I think the lists of the characteristics
23 of what we want in the ideal are not hard to find.
24 Everybody's talking about them. You can look at the
25 work that Resources for the Future is doing. There's

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1 some very nice stuff by John Applegate, who some of
2 you may know.

3 You know, here's the layering and
4 redundancy idea that I talked about. This notion of
5 reliability, you know, it's one thing to say that a
6 system will be reliable. I'm working with a professor
7 of government at American University, a guy named
8 Howard McCarty, who studies something called high
9 reliability organizations.

10 And he points out that the bureaucratic
11 organizational model is absolutely the enemy of
12 reliability. I mean, this is government theory. What
13 you want a bureaucracy for is constancy and
14 maintenance, and it has worked.

15 We have a postal service that we've had
16 since Benjamin Franklin still delivering the mail and
17 doing it pretty well, you know, constantly changing,
18 but basically delivering the mail.

19 So we have a flywheel in our bureaucratic
20 form of government that came from Max Weber that keeps
21 it all going in a way where it's predictable that what
22 we did in the Truman administration we can still do in
23 the Bush administration in pretty much the same way.

24 But that's not the same as reliability
25 that applies when you're dealing with hazards by any

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1 stretch. And in fact, it gets very difficult to do
2 that, right, and we all know the reasons, the budgets
3 and so forth.

4 You know, the money for long-term
5 stewardship, the things that's got many states
6 refusing to cooperate, refusing to say yes to DOE, is
7 they're just not assured that there's going to be the
8 commitment from anybody with funding to keep the
9 system going.

10 It's a real hard problem, let alone this
11 notion of how you really do. I mean, when you look at
12 reliability people start looking at things like the
13 flight crews that launch the space shuttle, or the
14 people that land planes on aircraft carriers.

15 And that's a very different kind of
16 organization. It's one that actually when you study
17 it, you discover it's not at all bureaucratic in its
18 character. It doesn't even respect its own hierarchy.

19 The guy who's -- the term "inside the
20 bubble," apparently, we were operating in the bubble
21 or along the bubble, comes from people on flight decks
22 who are in these plexiglass bubbles watching planes
23 come in for landings.

24 And this is usually a young -- you know
25 -- this is a navy, but this is a young guy. This is

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1 an ensign at best. It may even not be an officer. He
2 has authority. He has authority that won't be
3 questioned by his commanding officer.

4 If he waves the plane off, the plane is
5 waved off. He has a -- he's making a snap judgment.
6 He's running -- you know -- I don't want to dwell on
7 this too much, just to point out, though,
8 bureaucracies don't operate that way.

9 We do have accountability and slow process
10 and that isn't necessarily the way to assure that the
11 operations of something you really care about are
12 reliable. So you know, again, accountability,
13 feasibility, defense in depth that I talked about,
14 stability through time, you know, these are the kinds
15 of things we want to worry about.

16 And we want to make sure that when we put
17 these systems in place the objectives are clear,
18 right, of our organizations, the governance is clear.
19 Who's in -- we can't -- you know -- the Fish and
20 Wildlife Service and the Department of Energy are
21 going to have to come to some terms that relates to
22 fire suppression policy where it's necessary, right?

23 So it's got to be clear who's doing what.
24 It has to be integrated and there has to be positive
25 incentives. Employees, people at the bottom who

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1 really make sure that things really happen, if they
2 don't perceive that the incentives are in the right
3 direction, they don't behave in the right way.

4 So we think that we wanted to kind of
5 invert the sort of standard thought process here. We
6 think people should plan for uncertainty and plan for
7 fallibility. We wrestle a lot with this language, as
8 Ray will well remember.

9 And what we mean is, you know, not really,
10 literally, everything is going to fail, but to plan as
11 if it's going to fail and not as if it's going to
12 succeed. It's a different planning basis. It gets
13 you to a different place in a cautionary approach to
14 what you're doing.

15 Incentive structures have to be real. I
16 was at a -- I think -- were you on the -- no, actually
17 it was -- maybe you were on the committee with
18 Elizabeth Pate-Cornell (phonetic), where we looked at
19 maritime safety.

20 She gave a talk at the Society for Risk
21 Analysis last month in Washington, a very nice talk
22 about a study she did on the space shuttle system
23 where she was engaged to look at the problem of the
24 tiles.

25 If you know about the space shuttle, these

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1 heat-resistant tiles are everything to whether a
2 shuttle's going to be able to land or not without
3 burning up. And one of the things they found is that
4 the incentive structure was such that among the lowest
5 salary employees were people who were tile inspectors.

6 And there were jobs they aspired to where
7 they could make more money. So what you discover was
8 you never had any experienced tile inspectors. And
9 this is a purely intuitive thing. You know, this
10 one's got to be replaced or these are okay.

11 It's people learning in a kind of
12 intuitive way how to be good at that job, but they
13 don't stay in it. So when they realized that they
14 changed the whole job classification system with the
15 help of the union, and made tile inspector one of the
16 better-paying jobs.

17 And now, it's one that everybody wants and
18 you do get senior people. So that kind of stuff is
19 out there lurking and it's things that you really need
20 to be worrying about. So our findings were that
21 -- this isn't our finding.

22 It was DOE's finding, but we stole it from
23 them, I guess. All sites will require future
24 oversight. That's, you know, they count 140 some
25 major sites and they say 109 of them require long-term

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1 stewardship, no matter what clean-up occurs.

2 Engineered barriers do have limited lives.
3 That's the reality of them. Don't talk about 1,000-
4 year barriers. Institutional controls will eventually
5 fail. And by that I mean, if you don't keep renewing
6 them, they fail.

7 It's like it's got to be -- you've got to
8 keep starting all over again. There's nothing you can
9 put in place that you can reliably say will continue.
10 Remediation planning isn't taking long-term factors
11 into account.

12 Transport modeling is inadequate, and
13 we're recommending things like, for example, taking
14 the performance assessment idea -- this is something
15 that I think would be a natural to you people, to the
16 Nuclear Regulatory Commission, and talk about
17 institutional performance assessment.

18 What kind of standards and criteria for
19 the performance of institutions, you know, basically
20 administering, implementing institutional controls,
21 can we hold them to? And what should those standards
22 be? What's the error rate that's the tolerable error
23 rate?

24 Bob Bernero used to talk about this a lot.
25 He used to say the essence of the problem is the

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1 consequences of failure have to be tolerable. And if
2 you're not operating inside that domain, then you're
3 not operating in the right domain. Very interesting
4 idea.

5 You have to have a basic research program.
6 It's fundamental. We're just not to the point where
7 we know very much about these things in our scientific
8 understanding, both the natural and social side.

9 We need these organizational designs that
10 are more reliable than traditional bureaucratic forms.
11 That's a very difficult challenge, but it's the
12 reality. And we need to be, as I said, pessimistic in
13 our planning.

14 Assume that the institutional controls
15 will fall apart and then what. Ask yourself that
16 question. Assume that contamination migration
17 assumptions won't -- they tend to be very rosy
18 scenarios when you look at the kind of modeling that
19 is done at sites, for example, using EPA's REDRAD
20 model, where we assume the kind of homogeneity in the
21 subsurface that isn't necessarily there.

22 And you know, our basic conclusion is that
23 the approach is really the key. We call it long-term
24 institutional management. It's very comprehensive.
25 It's definitely iterative. It tries to be goal-

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1 focused and goal-oriented and tries to overcome all
2 the natural problems of bureaucracy.

3 Do we end up saying, here's a recipe for
4 how to do that? We don't. In fact, we say, there's
5 no recipe for success. It's something that's just
6 going to have to be worked out by people like you.
7 Believe it or not, that's all I have to say.

8 CHAIRMAN GARRICK: Great.

9 DR. WYMER: As usual, very, very lucid,
10 very interesting, Tom, and thank you very much.

11 Are there any questions here from the
12 Committee?

13 DR. LESCHINE: And fire away.

14 DR. WYMER: I think we're still reeling a
15 little.

16 CHAIRMAN GARRICK: What do you think's
17 going to happen to your report?

18 DR. LESCHINE: Good question. You know,
19 among organizations which are not real strong on
20 follow-through, the National Research Council. And I
21 think what should have happened or should happen are
22 some follow-up studies to try to turn this into kind
23 of an empirical reality.

24 There was a suggestion that there be some
25 studies that look at actual sites and try to look at

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1 the planning as being done in a detailed way and
2 compare it to this model. And I know that Kevin has
3 been working with Gerald Boyd on trying to come to
4 terms on something like that.

5 But my understanding is, nothing has
6 happened. So I think if there isn't follow-up, what
7 the difficulty is with all National Research Council
8 studies, they tend to appear in isolation. You know,
9 Bob Budnitz had the point -- although he's
10 masquerading as Carol Harris right now --

11 (Laughter)

12 DR. LESCHINE: -- made the point a couple
13 of years -- he's on the board. You still on the
14 board?

15 MR. BUDNITZ: No.

16 DR. LESCHINE: And one of his point on the
17 board was the board should do a study which is simply
18 to study its own studies and look for the consistency,
19 the coherency and start putting that out as a separate
20 message, that there are all these reports that point
21 in this direction, because otherwise, the follow-
22 through doesn't occur.

23 And DOE says fine, thank you, we're
24 already doing it, and that can be the end of the
25 story. So I don't know if we're going to have an

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1 impact in the long run. I hope that the stakeholders
2 and people like that take on the charge.

3 I was at a meeting in San Francisco and a
4 guy representing the Colorado Attorney General's
5 Office got up and gave the talk on the report. He
6 just had read it so thoroughly that every slide was
7 about a report.

8 And he said, this is the best -- he said,
9 this is what we need to finally be able to deal with
10 DOE on the terms and conditions for long-term care of
11 Rocky Flats. So you know, if it gets out in that way,
12 then if it's received in that sense I think you do
13 have a lasting impact.

14 But I am worried about that. As usual,
15 John Garrick asks the key question.

16 DR. WYMER: Any other questions, George?

17 DR. HORNBERGER: No.

18 MR. BUDNITZ: Can I make --

19 DR. WYMER: Yes, sure, Bob.

20 MR. BUDNITZ: I'm Bob Budnitz. I just
21 want to raise a question that seems to me fundamental
22 to the whole enterprise, and without knowing what the
23 answer is.

24 The reason why these meetings are
25 necessary and the reason why we're worried is because

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1 there's risk out there that we think is troubling if
2 it's not managed properly.

3 Risk to the environment, risk to public
4 health and safety, various kinds of risks that differ
5 from site to site, and in fact, differ over the
6 decades and millennia, depending on your time scale.

7 Now, part of the problem that I understand
8 involving the skepticism of the people at the sites,
9 these are DOE sites, but by the way could perfectly
10 well apply to a site where one or two or three nuclear
11 reactors are now sitting that it's going to be
12 decommissioned and managed whenever, some years hence,
13 exactly the same thing, is that the people at the site
14 having these concerns insist on certain end-points for
15 risk which they want because many of them wish there
16 had never been that thing there.

17 They'd just as soon it was 1930. And like
18 I said, this could perfectly well apply to a reactor
19 site or it could be Hanford or Fernald or wherever.

20 And sometimes, the reason why they're
21 skeptical of signing on to something like this is that
22 they don't believe -- and I understand why they don't
23 believe -- that the federal government will be there
24 50 or 100 years from now, the Congress will be there
25 with appropriations and with follow-through, or you

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1 know, and so on.

2 You say the Postal Service works. Well,
3 the Postal Service has revenue, you know. It's 34
4 cents and it's doing something -- I mean, we
5 understand this, but -- and the revenue's guaranteed
6 by as long as there's, you know, revenue.

7 But that's not true of most other
8 government agencies. In fact, hardly anything else is
9 like that. And so local people are afraid to sign
10 onto something without knowing, and they can't know
11 because Congress by definition in the Constitution can
12 only appropriate one year at a time, except when
13 they're building ships it can be three.

14 They just don't read the Constitution,
15 although it's literally what it says. Now, the
16 problem has to do with what risk is acceptable or what
17 risks are risks, and that's where the trouble comes.

18 You see, I remember hearing the classic
19 phrase. It's called the man from Maine. That's
20 interesting because the DOE has no sites in Maine.
21 That's why you use the man from Maine. Why would the
22 man from Maine appropriate his or her tax dollars to
23 fix something at Hanford and Savannah River?

24 The answer is because the man from Maine
25 benefitted from those activities, you know. I mean,

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1 that's always the rationale. We understand that
2 rationale. But sometimes, the remedy sought costs far
3 more than the real objective risk is, and that's the
4 problem.

5 And therefore, I want to insist on
6 something that is at least the perspective I bring to
7 this. Until and unless there is some agreed-on -- and
8 this is very hard politically -- rational allocation
9 of these risks and the benefits that allows the man
10 from Maine, the skeptical appropriator in the
11 Congress to feel that the money is being properly
12 allocated roughly, there will always be this concern.

13 And it rears its ugly head every time you
14 turn around and see something nuts. And if you'll
15 indulge me I'll just give you a 90-second thing about
16 something that's absolutely nuts that I was just
17 involved in.

18 At Idaho they have all this low-level
19 waste that's contaminated with a little bit of
20 plutonium that could otherwise go to WIPP, except it's
21 got a little bit of PCBs, so it can't go to WIPP.

22 So the scheme that the department came up
23 with after six or eight years of hard work was, we're
24 going to incinerate the stuff to get rid of the PCBs,
25 and then the ash -- it's perfectly good technology, it

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1 works -- the ash can go to WIPP.

2 And they did all this. They had the EIS
3 process. They had a record and decision. They were
4 going ahead with an incinerator to incinerate 65,000
5 cubic meters of this stuff. And the incinerator met
6 all applicable regulations at its fence post, which
7 was 35 miles from Idaho Falls.

8 The people in Jackson, 90 miles further
9 east, or 125 miles from the site, objected that some
10 of that stuff might get to them, and in fact, some
11 does, 10 to minus 44 or something. I don't know the
12 number, but anyway, it's nothing, but it's something.

13 And they had enough political muscle that
14 the secretary in August put the incinerator on hold
15 while he commissioned a blue ribbon panel that I set
16 up to explore alternatives to incineration, of which
17 there are some.

18 And we identified alternatives to
19 incineration. That was the charge. It's just been
20 published December 15th. You can go and read it. It
21 came out of the secretary's office at SEAD (phonetic).
22 I was part of that.

23 But all those alternatives cost tens of
24 millions of dollars more than the incineration, and
25 there's no risk that's being averted that wasn't

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1 averted before. And when that nonsense goes on, the
2 man from Maine is skeptical.

3 And that then leads to the skepticism of
4 the local people that the government will carry
5 through because they listen to political noises that
6 aren't necessarily risk-based.

7 And I think that this Committee, ACNW,
8 ought to wrestle hard with whether there's some
9 mechanism -- because obviously, you're concerned with
10 NRC licensed facilities, which are not necessarily
11 -- not just reactors that are going to be
12 decommissioned, but other facilities like that, that
13 NRC licenses and the -- you know -- the initial
14 facilities and obviously the waste sites, the Part 61
15 sites and Part 60 sites, Part 63 sites.

16 Seems to me that until and unless there is
17 some way to overcome that skepticism, the skepticism
18 just arises out of this risk misallocation, so people
19 feel they're mis-spending money, there isn't going to
20 be any easy way to overcome that problem.

21 And I think that's one of the real roots
22 of this long-term problem with commitment, and the
23 problem of commitment goes back to the risk.

24 DR. WYMER: Yes. And we have a member in
25 our Committee who's sitting on my left here, Milt

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1 Levenson, who echoes or says exactly the same thing
2 you've just been saying.

3 MR. BUDNITZ: I knew perfectly well that
4 Milt thought --

5 DR. LEVENSON: Well, I can give you --

6 MR. BUDNITZ: I've known Milt for a few
7 days or so.

8 DR. LEVENSON: I'll give you a better
9 example in connection with WIPP. A piece of plutonium
10 that's chrome-plated is taken into a glove box and
11 stripped the chrome off because you can't put it into
12 WIPP, but then you put that piece of plutonium in a
13 stainless steel barrel and bury it in WIPP because
14 "the stainless is not part of the waste," quote,
15 unquote.

16 MR. BUDNITZ: But the chrome --

17 DR. WYMER: Yes, that's a lot of chromium
18 in there.

19 MR. BUDNITZ: But I guess I was trying to
20 focus on the fact, and it is a fact, that when public
21 at the sites insist on measures that are very costly
22 that are not beneficial to the risk, it induces the
23 skepticism that induces their skepticism that Congress
24 will appropriate, and so it becomes a cycle. Okay.

25 DR. LEVENSON: Yes.

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1 DR. WYMER: Yes.

2 MR. BUDNITZ: And I don't know what to do
3 about that.

4 DR. HORNBERGER: So why does Jacksonhole
5 have more clout than the people from Maine?

6 DR. WYMER: He said they have more money.

7 MR. BUDNITZ: Well, in this particular
8 case they have more clout because there was an
9 election going on.

10 DR. WYMER: Yes.

11 MR. BUDNITZ: And there were donors; and
12 there were donors and they went to court. I mean, you
13 know, just different things, they're political things
14 that are --

15 DR. LESCHINE: Yes. They did see it. It
16 was in their back yard from retrospective, and the man
17 in Maine is silent --

18 DR. HORNBERGER: Yes.

19 DR. LESCHINE: -- because it's not in his
20 back yard.

21 DR. HORNBERGER: That was my point.

22 DR. LESCHINE: Yes.

23 DR. HORNBERGER: And I think that will
24 always be true.

25 DR. LESCHINE: Yes.

1 DR. HORNBERGER: I don't think that
2 there's a resolution for that. I had another comment
3 on -- for you, Tom. Then again, it's a little bit off
4 the subject. But as you pointed out, that nice graph
5 from Jane Long's report on travel time at INEL, and I
6 think that it is important, though, that we contrast
7 a minimum travel time with a mass flux.

8 MR. BUDNITZ: Yes.

9 DR. HORNBERGER: Those two things are
10 really different.

11 CHAIRMAN GARRICK: Yes. Yes.

12 DR. LEVENSON: Right.

13 DR. HORNBERGER: And it's not huge
14 quantities of plutonium that have made it down to the
15 inner beds in the Snake River plain.

16 DR. WYMER: Right.

17 CHAIRMAN GARRICK: So you need to talk
18 about mass flow.

19 DR. WYMER: Mass flow.

20 DR. HORNBERGER: Well, that's -- at least
21 it's another facet of the problem. I'm not saying
22 that we shouldn't talk about travel time, but it is
23 important to not think that everything is going that
24 fast.

25 MR. BUDNITZ: But I insist that that was

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1 the problem with the incinerator. People in Jackson
2 asked the question, will any of that stuff get to me,
3 and the answer was, 10 to minus 14 will. And by the
4 way, there's no -- you know -- there's nothing -- no
5 such thing as zero.

6 DR. HORNBERGER: Right.

7 MR. BUDNITZ: And they said, we want
8 nothing, and nothing is nothing. But there are no
9 zeros in the environment in this way, and that then
10 feeds, you know, the perception -- and then they gave
11 in so that that feeds the next guy who's going to try
12 it again, because they gave in this time.

13 DR. HORNBERGER: I actually do have
14 another question that follows on what Tom was
15 suggesting, and that is the -- I think you called it
16 the fragility of government controls, and I suppose
17 that in some ways the commercial controls are viewed
18 as even more fragile.

19 And I know in discussions like this people
20 somewhat frivolously say, well, why don't we engage
21 the Catholic Church because it's been going for a few
22 thousand years. Do you have any alternatives, other
23 than, say, national governments for being less
24 fragile?

25 DR. LESCHINE: Well, yes. I think in one

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1 word, oversight, that if you really have an engaged
2 citizenry that cares about a place and has a stake in
3 the environmental health of the place, that that would
4 -- I mean, that's what democracy should make work.

5 So you'd like to believe that maybe -- you
6 know -- everybody kind of looks to the Internet as a
7 solution to all problems, but the idea that it is
8 possible to put a lot more information out in front of
9 a public in a form that, you know, right now I would
10 say we're not doing all that well.

11 But got a graduate student, in fact,
12 working on the problem with transparency and what it
13 means and how you achieve it. And part of her
14 dissertation research is going to be to develop a
15 website based on this 100-area clean-up where you try
16 to put out information and then test it with a group
17 of people knowledgeable about Hanford and see, does
18 this help you understand what's going on and could you
19 imagine this thing being a useful way to track and
20 understand the system -- any system of controls and
21 the institutional controls being in place.

22 And I guess that's ultimately what you
23 have to rely on, right, because there just isn't a
24 magic priesthood out there that's going to do this
25 job.

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1 DR. HORNBERGER: In some ways it strikes
2 me that what you're suggesting is an equivalent to a
3 local priesthood, and that is, to have local interest
4 with an Aldo Leopold ethic.

5 DR. LESCHINE: Yes.

6 DR. HORNBERGER: Who will provide some
7 oversight.

8 DR. LESCHINE: And again, the difficulty
9 at DOE sites is some of the -- you know -- they have
10 the Citizen Advisory Boards and these things have been
11 very fractionated at some of the sites.

12 And the one at Oak Ridge is one where -- I
13 think it was Oak Ridge -- where we had an exit
14 actually from the board of the entire environmental
15 contingent. And Oak Ridge is very split because the
16 community there, the business interests, the Chamber
17 of Commerce, have really been pushing hard this re-
18 industrialization approach.

19 And we went down there and we got some
20 presentations from them, and I have to say, I did feel
21 that there were people in very nice suits who
22 represented the business community and didn't know
23 anything about the risk who were simply asserting that
24 there was no risk, or that there would be no risk,
25 because, really, what they wanted was economic

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1 development, and you have to be able to counter that.

2 And so yes, but you know, how you maintain
3 that is very difficult. You really have to take the
4 long perspective, and recognize that there may be
5 periods where you don't have a very good balance
6 between the two interests.

7 And you hope that you will restore that
8 balance in the future. But you have to take into
9 account what Bob was saying, too, that you know, that
10 the Citizens' Group is just as capable of sort of
11 pushing down the road toward these unrealistic clean-
12 ups that are very expensive.

13 And that kind of creates its own kind of
14 difficulty because that starts creating economic
15 inefficiency, which raises the ire of the counter to
16 that, the business interests. No easy solution.

17 DR. WYMER: No, there's no easy solution.
18 Are there any other questions around the table here?
19 How about from the audience? That certainly was a
20 -- John, please. John Greeves.

21 MR. GREEVES: Yes, just -- John Greeves.
22 I don't know whether it's a question or really a
23 comment. The report presents at least two problems to
24 us. One is, the report identifies inadequate
25 modeling.

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1 And frankly, that's what we use to
2 terminate sites. We do this all the time. We're
3 terminating sites every year. We use modeling,
4 predictive tools. So the Academy putting out a report
5 like that, it's a tool that people could bring to the
6 table, you know.

7 If it went to a hearing, Academy says the
8 models are inadequate. So that I'm not looking for an
9 answer. I'm just identifying a concern. And Bob, you
10 chuckle over there. Maybe you can give me some help
11 on that, because as you know, we -- you do use
12 modeling for high-level waste, low-level waste,
13 terminating sites.

14 And for a National Academy Report to say
15 inadequate is a challenge. The second one is, I know
16 you did this report in the context of the Department
17 of Energy and you stressed an integrated approach in,
18 it sounds like an evolving management process.

19 Maybe that's okay for the Department of
20 Energy, but in the commercial sector the idea is
21 you've got to terminate sometime.

22 DR. WYMER: Yes.

23 MR. GREEVES: How do you price out
24 something that stresses an evolving approach so you
25 can get enough money up front to account for what you

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1 described? I see that as a bit of a challenge for
2 the, you know, the bigger sites, the 10, 12 that we,
3 you know, may have a similar problem with.

4 So I don't expect an answer, but I share
5 with you what a read of the report you produced has in
6 terms of impacts on the commercial sector.

7 DR. WYMER: Right.

8 DR. LESCHINE: Well, what you just said,
9 I mean, you used the key words in your remark, price
10 out, and that's that notion of creating some kind of
11 a fiduciary mechanism, a trust of some sort that can
12 be there when the private enterprise -- private entity
13 is gone.

14 And yes, you know, that absolutely is the
15 case of any brown fields or Super Fund site in the
16 private sector. That private entity always wants to
17 buy out of that site. It's a liability that they're
18 carrying and it's only sensible.

19 And it's sensible when you get to the
20 appropriate point to permit them to do that. So then
21 it really does become a question of the mechanism.
22 Resources for the Future last month had a meeting on
23 trust fund mechanisms.

24 I didn't go to it, but I heard from
25 several people -- I think Bob was there -- that it was

1 a very interesting meeting, and they -- you know
2 -- they talked about some of the -- I think they came
3 down on the side of kind of state and local
4 arrangements over federal, because federal trust funds
5 have some innate difficulties from our constitution
6 that they really just become IOUs and not real money
7 in the bank, and you're actually not avoiding the
8 Congressional appropriation problem.

9 But I think there's, you know, good
10 experience in the brown fields world, for example. At
11 one point in our report we got a presentation from a
12 guy named Ed Frost who's a very prominent attorney
13 who's worked in brown fields area, worked with Tom
14 Grumley for awhile, in fact.

15 And they were talking about these kinds of
16 arrangements where essentially you've got to figure
17 out up front what the right amount of money is. And
18 if you do that and you turn that over to the
19 government entity or whoever, it could even be another
20 private sector entity, why not, you know, that's how
21 you do it.

22 So that's the mechanism, but we have to
23 rely on that mechanism. You know, the State of
24 Tennessee has an interesting experiment where they did
25 negotiate a trust over some facilities at Oak Ridge.

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1 But it was very interesting what they did,
2 because even after this tremendous battle with DOE
3 over the principle of the trust fund, DOE relented and
4 they created a trust.

5 But they did it for -- when it was done,
6 the battle was won -- I guess we would argue and it's
7 in our report -- the war was lost because they took no
8 uncertainty into account, and only looked at the
9 predicted cost of maintaining and monitoring a cap.

10 And so they settled on \$14 million, which
11 they amortized into the exact dollar value of the
12 estimated monitoring and maintenance of the cap at the
13 site in perpetuity, or for as long as was necessary
14 for the -- given the hazard.

15 Well, you know, that's kind of the right
16 approach but the wrong answer, because what's missing
17 there is factoring in the uncertainty and the real
18 scenarios of what can go wrong and what happens if
19 that goes wrong.

20 So you know, these trusts could be the
21 answer but they have to be done in a way that takes
22 the uncertainties into account and doesn't just ignore
23 them. And again, that gives --

24 MR. GREEVES: Those uncertainties will
25 drive the cost up significantly.

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1 DR. LESCHINE: Yes. Well, that's where
2 you -- but you know, those exist in the private sector
3 and don't we use insurance to do that? And so
4 sometimes, insurance schemes are preferable because
5 you pool the risk if you have an insurance company out
6 there.

7 And something will go wrong at one site,
8 but it won't go wrong at every site. So in that way
9 we sort of meter out the money on a, you know,
10 actualized risk basis. That's some people's
11 suggestion.

12 DR. LEVENSON: Has anybody gone back and
13 looked -- we do have a lot of experience over a long
14 period of time in a somewhat different field -- in
15 perpetual care in cemeteries, who make estimates and
16 funded things and costs have changed over time.

17 Have anybody gone back and see if there's
18 anything to be learned from all of that experience?

19 DR. LESCHINE: If you read the literature
20 that comes out of the social sciences on long-term
21 care and maintenance, cemeteries are a very prominent
22 model. National parks are another model, too.

23 You know, Yellowstone is still there as
24 Yellowstone. As our first national park, it's more
25 than 100 years old. But cemeteries are good ones, you

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1 know, except what happens with cemeteries is they do
2 drive you to the edge of sort of your limits of
3 control, you know, that kind of cultural imperialism
4 where one group overcomes another.

5 And often, what they do is go out and
6 desecrate the cemeteries. So the Arlingtons get very
7 well taken care of, but the Jewish cemetery in Warsaw
8 does not, you know. So those are the dilemmas that
9 you have to face, but yes, a cemetery is a good model
10 because there's an income flow in a way.

11 People die, except you know, the Catholic
12 Church is having a hard time maintaining some of its
13 cemeteries right now, and it's turning into kind of a
14 little crisis for them because of the changing
15 demographics of the population.

16 And they're not maintaining the income
17 flow they had expected. So but it's an interesting
18 model.

19 DR. WYMER: Okay. Well, is there any
20 other comments or observations? It's certainly a
21 provocative talk, and it's a challenging field.
22 There's no question about it, this whole business of
23 institutional management.

24 DR. LESCHINE: Yes. I think this report,
25 I have to say, we raised many more questions than we

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1 had answers, as Carolyn Huntoon pointedly said.

2 DR. WYMER: Yes.

3 DR. LESCHINE: So.

4 DR. WYMER: Well, thanks again. I know
5 you came here at some personal sacrifice. We
6 appreciate it.

7 DR. LESCHINE: Well, it's my pleasure.
8 Thank you.

9 DR. WYMER: Very much.

10 CHAIRMAN GARRICK: All right. This
11 actually ends the presentation phase of our meeting,
12 especially since I regret to announce that John
13 Ahearne came down sick this morning, with chills and
14 headaches and sore throats and has had to cancel his
15 visit with us this morning.

16 So from this point on we will not need
17 recording and there will no longer be any formal
18 presentations and the committee will, after the break,
19 reconvene to do some planning and business-related
20 activities.

21 So we adjourn with a 15-minute break.

22 DR. WYMER: Thank you.

23 (Whereupon, this portion of the 124th
24 meeting of the Advisory Committee on Nuclear Waste was
25 concluded at approximately 10:50 a.m.)

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